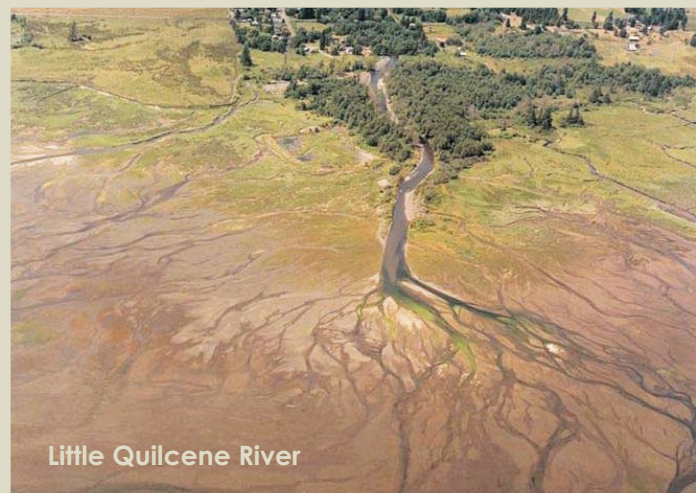


FINAL REPORT
JUNE 30, 2003

Quilcene-Snow Watershed Planning (WRIA 17) Water Quality Monitoring Plan



Chimacum Creek



Little Quilcene River



Jimmycomelately Creek

**QUILCENE WATERSHED (WRIA 17)
WATER MONITORING QUALITY PLAN**

Submitted to:

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FINAL WQ PLAN WRIA 17

EXECUTIVE SUMMARY

As part of watershed planning being undertaken in Water Resources Inventory Area 17 (WRIA 17; Quilcene-Snow Watershed), the WRIA 17 Planning Unit is conducting a supplemental assessment of water quality. The following report describes the assessment, which was conducted in two phases. In the first phase, metadata were collected from various agencies in order to create a comprehensive picture of existing water quality data collection programs in the watershed. In the second, goals, objectives, and recommendations for a coordinated water quality management plan for WRIA 17 were developed, along with a GIS (geographic information system) product that will be the framework for this program.

The Water Quality Monitoring Plan is intended to facilitate long-term water quality monitoring in WRIA 17. The purpose of the monitoring plan is to provide the basis for a coordinated data collection effort throughout WRIA 17. As applicable, the plan will assist planning efforts by determining whether data of the appropriate quality and quantity are collected, optimize the sampling locations, improve consistency in the data collected, improve coordination of sampling efforts, and ensure cost-effectiveness in future studies. The plan includes a summary of water quality recommendations in the watershed, as well as guidelines for continuation of the monitoring effort and a framework for the adoption of a spatial WRIA-wide water quality database.

This Water Quality Monitoring Plan provides an overview of existing monitoring programs occurring in WRIA 17, per the input provided by Technical Committee members. The sample locations for each program have been digitized or input electronically into GIS maps for each water type (groundwater, surface water, marine water) to provide an integrated view of the currently active and inactive sample collection locations in the WRIA. In addition, the parameters collected at each sample location are indicated on the maps. The priorities and recommendations provided by the Technical Committee are incorporated into this Plan.

The intent of this document is to determine whether monitoring programs require deletion, addition, or modification based on the needs of the Technical Committee and their constituencies. Our proposed revisions are for reaches that need to be monitored; development of specific monitoring locations will require field visits and further consultation with members of the Technical Committee who are well-versed in water quality issues and programs in the Quilcene-Snow watershed. It is anticipated that identifying specific sampling locations within the recommended reaches will be accomplished under further supplemental funding for water quality assessment or by participating entities currently involved in monitoring the watershed.

A GIS mapping product is provided with this plan that is intended to be the implementation tool for this sampling plan. The mapping product includes detailed maps of current and historic data collection locations, the parameters collected at each location, the frequency of data collection at each location, and the agency or overseeing party that collected data at each location. This mapping product provides planners the ability to plan future sampling efforts by identifying areas that have incomplete or inadequate coverage, or areas that have overlapping coverage. In addition, this product can provide planners with an integrated overview of the entire WRIA, which can be used to identify more conceptual plans for water quality data collection, such as identifying areas to collect background water quality data, or discovering areas that potentially could be indicative of future water quality issues, such as densely developed areas near streams.

Groundwater Quality Monitoring Plan

A majority of the groundwater monitoring conducted in WRIA 17 is done by mandate by the Washington State Department of Health, and as such can not be revised to any great extent. It was determined that groundwater monitoring can be improved by better managing the existing programs using the GIS mapping product. With this mapping product, agencies can begin to tie spatial relationships to their groundwater monitoring data and can readily track groundwater sampling activities and plan future sampling events.

Surface Water Quality Monitoring Plan

Proposed revisions to the existing sampling programs in WRIA 17 are presented in the water quality monitoring plan by priorities, as established by the Technical Committee. Current sampling locations as well as proposed sampling locations (listed by high, medium and low priority) are presented in Table 9, and are presented graphically in Figure 12. The proposed high priority sampling revisions are listed below by parameter.

Additional Flow Gauges – None

Fecal Coliform

- Jackson Creek and Shine Creek – add parameter to existing S’Klallam gauge.
- Jimmycomelately Creek – add parameter to existing Ecology gauge,
- Johnson Creek – add new gauge.
- Little Quilcene River – add to existing Port Townsend gauge upstream, and

Total Suspended Solids and Turbidity

- New gauges – Houck Creek, Indian George Creek, Townsend Creek, Trapper Creek, and Tunnel Creek.
- Add to existing Ecology gauges – Andrews Creek and Jimmycomelately Creek.
- Add to existing Jefferson County gauge – Jakeway Creek.
- Add to existing S’Klallam Tribe gauges – Marple Creek, Penny Creek, Ripley Creek, Shine Creek, Spencer Creek.

Dissolved Oxygen, pH and Temperature

- Add (dissolved oxygen and pH only) to existing Ecology gauges - Andrews Creek, Jimmycomelately Creek, and Shine Creek.
- Add (dissolved oxygen and pH only) to the existing S’Klallam Tribe temperature gauges – Shine Creek.
- Add (all three parameters) to existing Jefferson County gauges – Barnhouse Creek and Jakeway Creek.

Continuous Temperature

- New gauge – Contractors Creek.

Nitrogen and Phosphorus

- Add to existing Ecology gauge – Jimmycomelately Creek.
- Add to existing Jefferson County gauge – Barnhouse Creek.

Stormwater Quality Monitoring Plan

The Technical Committee determined that a stormwater monitoring program should be established in four locations within the watershed: Port Townsend, Port Ludlow, Glen Cove, and Tri-Area Urban Growth Area. Port Ludlow currently oversees an extensive stormwater monitoring program that includes flow, pH, temperature, specific conductivity, dissolved oxygen, turbidity, and fecal coliform monitoring on a monthly basis. A more comprehensive list of parameters is monitored annually in the Port Ludlow program.

It is proposed that stormwater quality monitoring be established in the Glen Cove, Port Townsend, and Tri-Area UGA areas. The monitoring programs in these areas should be modeled after the existing stormwater program in Port Ludlow.

Marine Water Quality Monitoring

Marine water quality monitoring is currently overseen by the Washington Department of Health, and can not be revised in the context of this plan. However, additional sampling locations are proposed to monitor areas where worsening trends have been observed.

In Quilcene Bay, six of nine monitoring locations exhibited a declining trend in fecal coliform over the period of 1995 to 2001. It is proposed that a detailed source tracking monitoring program be established in Quilcene Bay to locate and remedy fecal coliform problems before conditions worsen further.

The Technical Committee prioritized the following areas for additional marine water quality monitoring:

- High Priority – Near Quilcene (where monitoring is currently being conducted).
- Medium Priority – Two locations on the east side of Discovery Bay and one near Port Townsend.

Recommendations

The following recommendations are provided to assist in the implementation of the monitoring plan, and to improve on existing products and resources provided in this report..

The GIS mapping product provided in Appendix C of this report can serve as the framework for future creation of a dynamic GIS/Access database product for water quality data management and illustration of water quality trends and levels. A centralized database would incorporate a relational

Access database to GIS maps to provide a standard viewing and updating mechanism for the data and sampling locations.

It is possible to link the dynamic GIS/Access database to an internet/intranet site where a limited number of individuals may be provided secure access to update the catalog, and where a broader set of individuals may view the catalog on a read-only basis. This would be effective both as a tool for coordination and communication between agencies, and for public outreach and education.

The first step toward coordination of monitoring efforts was the creation of the GIS Mapping Product and the development of monitoring priorities by the Technical Committee. Now that this information is stored in a centralized GIS system, further analysis of monitoring locations can be conducted using drainage area delineation functionality of a GIS product, as well as land cover data, parcel data, and stormwater drainage network data (where available). These analyses will allow the user to visually demonstrate which areas are receiving waters for different potential pollutants and potentially hazardous land uses, and assign monitoring locations accordingly.

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Background.....	1
1.2	Water Quality Monitoring Plan Purpose	1
1.3	Report Organization.....	2
2.0	WATER QUALITY DATA/INFORMATION	3
2.1	Metadata Sources.....	3
2.2	Metadata Catalog	4
2.3	Groundwater Quality Monitoring Programs	4
2.4	Surface Water Quality Monitoring Programs	5
2.5	Marine Water Quality Monitoring Programs.....	7
3.0	WATER QUALITY MONITORING PURPOSE AND OBJECTIVES.....	8
3.1	Groundwater Monitoring Objectives	8
3.2	Surface Water Monitoring Objectives	8
3.3	Stormwater Monitoring Objectives	9
3.4	Marine Water Monitoring Objectives.....	10
3.5	GIS Mapping Product	10
4.0	WATER QUALITY MONITORING PLAN	11
4.1	State Water Quality Standards.....	11
4.2	Standard Water Quality Monitoring Protocols	11
4.3	GIS Mapping Product.....	12
4.4	Groundwater Monitoring.....	13
4.4.1	Groundwater Quality Proposed Revisions.....	13
4.5	Surface Water Monitoring.....	14
4.5.1	Flow – High Priority	15
4.5.2	Fecal Coliform – High Priority	16
4.5.3	TSS, Turbidity – High Priority	17
4.5.4	Dissolved Oxygen, pH, Temperature (grab) – High Priority.....	18
4.5.5	Continuous Temperature Monitoring – High Priority	19
4.5.6	Nitrogen and Phosphorus – High Priority.....	20
4.5.7	Surface Water Quality Index	21
4.6	Stormwater Monitoring Program.....	21
4.7	Marine Water Quality Monitoring.....	23
4.7.1	Marine Water Quality Proposed Revisions	23
5.0	RECOMMENDATIONS	24
5.1	Creation of a dynamic GIS/Access database product	24
5.2	Development of a Web Page	24
5.3	Further Analysis of Monitoring Locations	24
6.0	REFERENCES	25

LIST OF TABLES

Table 1	Organizations
Table 2	Contacts
Table 3	Programs
Table 4	Program Information
Table 5	Publications
Table 6	Locations
Table 7	Stations
Table 8	1998 EPA 303(d) List
Table 9	Stream Monitoring Priorities

LIST OF FIGURES

Figure 1	Groundwater Sampling Locations
Figure 2	DOH Groundwater Sampling Locations
Figure 3	Surface Water Sampling Locations
Figure 4	Marine Sampling Locations and Priorities
Figure 5	303(d) Listed and Impaired Waterbodies (1998)
Figure 6	Surface Water Sampling Locations and Frequency (Stream Flow)
Figure 7	Surface Water Sampling Locations and Frequency (Fecal Coliform)
Figure 8	Surface Water Sampling Locations and Frequency (TSS/Turbidity)
Figure 9	Surface Water Sampling Locations and Frequency (Dissolved Oxygen, pH, and Temperature)
Figure 10	Surface Water Sampling Locations and Frequency (Temperature Data Logger)
Figure 11	Surface Water Sampling Locations and Frequency (Nitrogen/Phosphorus)
Figure 12	Stormwater Monitoring Stations
Figure 13	Proposed Additional Locations and Parameters

LIST OF APPENDICES

Appendix A	Water Quality Regulatory Standards
Appendix B	Sample Collection Protocol (Surface Water)
Appendix C	GIS Mapping Product

1.0 INTRODUCTION

Watershed Resource Inventory Area 17 (WRIA 17; Quilcene-Snow Watershed) consists of approximately 401,000 acres within the northwest portion of the Puget Lowlands in Puget Sound near the confluence of Admiralty Inlet and Hood Canal. The WRIA 17 Planning Unit is comprised of Jefferson and Clallam Counties, the City of Port Townsend, as well as local tribes, special purpose districts, state agencies, public non-profit organizations, and private industry.

The primary land cover in WRIA 17 is forest. The majority (72%) of land is held in private ownership, with federal and state lands, and the Jamestown S’Klallam tribal lands making up the remainder. The watershed falls within Jefferson and Clallam counties. Major populated areas within the watershed include Port Townsend, Port Ludlow, and the Tri-Area Urban Growth Area.

1.1 Background

A Level I Technical Assessment was completed for WRIA 17 in August 2000 (Parametrix 2000) to provide a summary of existing watershed information, assess potential growth impacts, and identify potential data gaps for this watershed per the requirements of the Watershed Management Act (RCW 90.82/ESHB 2514).

Based on the results of previous assessments, the WRIA 17 Planning Unit identified the need for a WRIA-wide Water Quality Monitoring Plan. In the Scope of Work dated April 21, 2003, Golder Associates provided a proposal for developing a coordinated water quality monitoring plan for WRIA 17 using existing data collection programs. It was proposed that the plan be developed in two phases:

- 1) Compile and review information on existing water quality data collection programs, then
- 2) Develop a coordinated Water Quality Monitoring Plan that addresses the primary issues identified by the Planning Unit.

The first phase of the plan was summarized in a Technical Memorandum submitted to the Planning Unit on May 6, 2003, and is incorporated in this report. The second phase, a coordinated monitoring plan, is also presented in this report. Information obtained from the WRIA 17 Planning Unit, and data summarized in the Level I Technical Assessment provided the basis for this phase of development of the Water Quality Monitoring Plan.

1.2 Water Quality Monitoring Plan Purpose

Water quality data collection has been conducted throughout WRIA 17 for a variety of purposes and by a number of organizations. Data have been collected by tribes, counties, one municipality, state and federal agencies, public water systems, and non-profit organizations. To date, there has not been a mechanism for providing consistency between each sampling program’s objectives, protocols, list of parameters measured or analyzed, analytical requirements, quality control/quality assurance, and reporting methods.

The Water Quality Monitoring Plan is intended to enable long-term monitoring of groundwater and surface water quality in WRIA 17. The purpose of the monitoring plan is to provide the basis for a coordinated data collection effort throughout the watershed. As applicable, the plan will ensure that the appropriate quantity and quality of data are collected, optimize the sample locations, improve consistency in the data collected, improve coordination of sampling efforts, and be cost-effective for future studies.

The metadata that was compiled in the first phase of this project were used to develop a Water Quality Monitoring Plan for WRIA 17. The monitoring plan is intended to be a dynamic plan based on current and historic water quality data collection programs, which can be built upon with additional monitoring programs in the future.

Based on discussions with the Technical Committee, it was determined that a centralized mapping reference for historic and current sampling programs would be beneficial for water quality planning efforts. A GIS mapping product was developed as part of this plan to illustrate sample point locations throughout the WRIA and to be used as a tool for illustrating locations where samples are needed. The mapping product provides a centralized framework for viewing existing sampling programs, and can be used to plan future sampling programs by providing a means of determining what data collection activities have occurred in specific geographic locations throughout the WRIA.

1.3 Report Organization

This report is organized into seven sections. Section 2 provides an overview of groundwater, fresh water, and marine water quality monitoring program metadata collected as part of the first phase of this project. Section 3 describes the specific objectives of the WRIA 17 Water Quality Monitoring Plan. A water quality monitoring plan, including recommendations for changes to current water quality monitoring in the watershed are presented in Section 4, based on prioritizations provided by the Technical Committee. Section 5 presents recommendations for potential options for water quality monitoring programs.

Water quality standards for surface and marine water and groundwater are provided in Appendix A. Sample collection protocols for stream sampling are provided in Appendix B. Appendix C provides an overview of the GIS mapping product developed for the Quilcene watershed as part of this plan, as well as the mapping product itself.

2.0 WATER QUALITY DATA/INFORMATION

A Technical Memorandum on Water Quality Metadata in WRIA 17 was submitted to the Planning Unit on May 6, 2003. This memorandum detailed metadata for current and historical water quality monitoring efforts in the basin. The Metadata Catalog provides a preliminary indication of the level of coordination and diversity in the numerous on-going water quality monitoring programs in the Quilcene watershed. The Metadata Catalog has been updated with input from the Technical Committee, and is presented in Tables 1 through 8.

GIS figures illustrating current and historical sampling locations for surface, ground, and marine water in the watershed were developed in the first phase of this project. Using these figures, Technical Committee members prioritized waterbodies for monitoring based on parameters to be monitored and the importance of monitoring those parameters at each location. This input from the Technical Committee was compared with GIS figures illustrating current and historic monitoring to find gaps and develop the Water Quality Monitoring Plan.

2.1 Metadata Sources

Several county, state and federal agencies, tribes, and multi-agency groups were contacted based on information provided by WRIA 17 Planning Unit members. Internet searches were also conducted. The following organizations were canvassed for water quality monitoring program information, reports, sampling locations, or data:

State of Washington

- Department of Ecology
- Department of Health
- Department of Fish and Wildlife
- Department of Natural Resources
- Puget Sound Water Quality Action Team

Counties

- Jefferson County Conservation District
- Jefferson County Department of Social and Health Services
- Jefferson County Environmental Health Department
- Jefferson County Planning and Building Department
- Jefferson County Natural Resources Division
- Clallam County Health Department

Cities

- Port Townsend

Other

- Port Ludlow
- Tri-Area Urban Growth Area

Tribes

- Port Gamble S'Klallam
Point No Point Treaty Council

Federal Programs

- US Geological Survey
- US Forest Service
- US Environmental Protection Agency
- US Fish & Wildlife
- US Department of Agriculture
- Natural Resources Conservation Service
- National Oceanic & Atmospheric Administration

Internet search

- Ecology
- DOH
- USGS
- USEPA

2.2 Metadata Catalog

As reported in the Technical Memorandum, a metadata catalog was developed to organize the data collection information into seven worksheets as described below. The worksheets are available in the Tables section of this report.

- **Organizations:** Table 1 contains a list of organizations responsible for data collection programs. This list provides a mechanism to ensure that organization names are consistent throughout the catalog. The sheet contains the full name of organizations relevant to water quality monitoring programs in WRIA 17. The *Organizations* and *Contacts* sheets together comprise a “Who’s who” resource for the *Programs* sheet.
- **Contacts:** Table 2 contains contact information (email, phone, fax, address, etc.) for people responsible for managing datasets. The contact names are listed in the *Programs* sheet.
- **Programs:** Table 3 describes data collection efforts and available datasets. Metadata records are listed by organization and monitoring program or dataset name. The *Organization* and *Monitoring program name* fields can be combined to form a unique metadata record identifier. In some cases where programs have multiple gauges/sampling locations with different periods of record, the parent program is bolded and the gauges/sampling locations, if available, are listed separately below.
- **Program Information:** Table 4 lists the purpose of water quality sampling program, location of sampling program information (generally either state or WRIA), data storage format, and program and metadata internet locations.
- **Publications:** Table 5 contains information on publications related to surface water quality sampling in WRIA 17 and bibliographical information. The publications often describe project-specific data collection efforts that are otherwise unavailable. This table also includes background information sources that were consulted for this memorandum.
- **Locations:** describes the hierarchical (i.e., upstream/downstream) relationships between water bodies so that queries of water quality information at specific locations can return available information at an upstream site. For locations where georeference data or other pertinent information is not available, the location spreadsheet is not complete.
- **Stations:** contains information specific to stream flow gauging stations. For locations where georeference data or other pertinent information are not available, the station spreadsheet is not complete, however the sheet lists all the stations provided by PU member responses to the metadata request.

2.3 Groundwater Quality Monitoring Programs

Groundwater Metadata were collected for a large number of groundwater quality monitoring programs. This section provides a summary of the metadata received.

Groundwater quality data were collected in WRIA 17 under the following programs:

- **Washington Department of Health, Public Water Supply Water Quality Monitoring**
Parameters: antimony, arsenic, barium, beryllium, cadmium, chloride, chromium, color, conductivity, copper, cyanide, fluoride, hardness, iron, lead, manganese, mercury, nickel, nitrate-N, nitrite-N, total nitrogen, selenium, silver, sodium, sulfate, thallium, turbidity, zinc, radionuclides, volatile organic compounds, and synthetic organic compounds.

- **Clallam Health Department, Drinking Water Program**
Parameters: fecal coliform, nitrate, chloride.
- **Jefferson Environmental Health Division, Drinking Water Program**
Parameters: nitrate, chloride.
- **USGS, Groundwater Quality Monitoring Program**
Parameters: pH, inorganics, specific conductance, aquifer level.
- **Ecology, Groundwater Quality Program**
Parameters: nitrate, chloride.
- **Port Ludlow Area Groundwater Monitoring Program** (17 sites. Four of the sites are provided by Jefferson County Public Utilities District; seven participants provide the other 12 wells.)
Parameters: nitrate, chloride.
- **Miscellaneous Programs.** These include citizen groups, local organizations, and other programs. Monitoring organizations or groups are as follows:
Bridgehaven Water System, City of Port Townsend (two sites), Jefferson County Water District Paradise, Jefferson County PUD (6 sites), Kala Point Water System, Quilcene Admin Site, and Quilcene National Fish Hatchery.
Parameters: nitrate, chloride.

Georeference information was obtained from each program listed above, and was plotted on a GIS map, as shown in Figures 1 and 2. Figure 1 shows locations for groundwater monitoring locations, including the Clallam County, Jefferson County, USGS programs, and the miscellaneous data collection locations listed above. Port Ludlow Area Groundwater Monitoring Program wells are included in “miscellaneous” since they overlap with other programs.

The Washington State Department of Health database consists of compliance monitoring data for public water systems (group A and B wells) throughout the state. The georeference information for wells in the WDOH database was limited to Township/Range/Section data in the maps presented in the Technical Memorandum. WDOH recently completed more detailed mapping of their wells, which are illustrated in Figure 2. These wells differentiated from other monitoring programs because they are often only sampled about every three years, whereas other sampling programs include more frequently repetitive sampling at sampling sites.

2.4 Surface Water Quality Monitoring Programs

Surface water quality monitoring metadata was collected for a large number of monitoring programs. This section provides a summary of the metadata received. Sampling sites that had spatial information were plotted on a GIS map, and are shown in Figure 3.

Surface water quality data were collected in WRIA 17 under the following programs:

- **Port Townsend, Streamflow monitoring at two locations**
Parameter: discharge, temperature, turbidity.
- **USGS, National Streamflow Information Program**
Parameter: discharge.

- Active*: Big Quilcene R. below Diversion nr Quilcene. (At Little Quilcene below Diversion, data are not published, but are collected by USGS)
- Inactive*: Snow Cr. nr Maynard WA, Little Quilcene R. nr Quilcene WA, Chimacum Cr. nr Chimacum WA, Penny Cr. nr Quilcene WA, Big Quilcene R. nr Quilcene WA, Big Quilcene above Diversion.
- **USGS, Water Quality Monitoring**, two sites (no spatial information)
Parameters: total coliform, pH, specific conductivity, dissolved oxygen, nutrients, color, nitrate, chloride, inorganics, temperature, discharge.
- **Department of Ecology, River and Streamflow Monitoring Program with Jefferson County Natural Resources Division**
Parameters: discharge, air temperature, water temperature.
-*Active*: Little Quilcene nr Mouth, Big Quilcene nr Mouth, Snow Cr. at WDFW, Salmon Cr. at West Uncas Rd., Tarboo Cr. nr mouth, Thorndyke Cr. nr mouth, Chimacum Cr. nr mouth, Jimmycomelately Cr. nr Mouth.
- **Department of Ecology, River and Stream Water Quality Monitoring Program**
Parameters: Fecal Coliform, pH, Specific Conductivity, dissolved oxygen, Toxins, Nutrients, Temp, Discharge
-*Active*: Big Quilcene R. nr Mouth, Jimmycomelately Cr. Nr Mouth.
-*Inactive*: Chimacum Cr. nr Irondale, Big Quilcene R. nr Quilcene, Chimacum Cr. at Hadlock, Chimacum Cr. at Chimacum, Chimacum Cr. nr Chimacum.
- **Department of Ecology, Nonpoint Source Pollution Studies** (no spatial information)
(freshwater, marine.
Parameters: fecal coliform, pH, specific conductivity, dissolved oxygen, toxins, nutrients, turbidity, temperature.
- **S’Klallam Tribe, Stream Temperature Monitoring Program**
Parameter: temperature.
- **USFW, Quilcene Water Quality Monitoring Program**
Parameters: Penny Creek Hatchery – temperature. Big Quilcene at Diversion – temperature, discharge.
- **Jefferson County Conservation District, Surface Water Quality Database**
Parameters: fecal coliform, total coliform, Enterococci, pH, specific conductivity, dissolved oxygen, nutrients, turbidity, nitrate, temperature, discharge, salmon (juvenile), salmon (adult), benthics, fish.
- **Jefferson County Conservation District, Water Quality and Fish Monitoring Program**
Parameters: unknown.
- **Ludlow Drainage District, Ludlow Watershed Water Quality Monitoring** (no spatial information) (*inactive*)
Parameters: unknown.
- **Pope Resources, Port Ludlow Non-Point Monitoring Program** (13 sites)

Parameters: discharge, temperature, dissolved oxygen, specific conductivity, total suspended solids, turbidity, fecal coliform, total N, nitrates and nitrites, phosphorus, ammonia, copper, iron, lead, zinc, hardness, toxics.

- **Port Townsend (two sites)**

Parameters: drinking water parameters, temperature, turbidity, discharge.

- **Pacific Ecological Institute, Citizen Water Quality Sampling, Leland Watershed. (7 sites)**

Parameters: water temperature (data logger), air temperature, dissolved oxygen, fecal coliform, pH, specific conductivity, total phosphorus, total nitrates (TKN), chlorophyll a for lake sites only.

2.5 Marine Water Quality Monitoring Programs

Marine Water Metadata was collected and is summarized below. Ecology and WDOH sampling sites were plotted on a GIS map, and can be seen in Figure 4.

Marine water quality data were collected in WRIA 17 under the following programs:

- **Department of Health, Commercial Shellfish Licensing and Certification**

Parameters: fecal coliform, toxins, benthic invertebrates.

- **Department of Health, Shellfish Growing Areas Classification Program**

Parameter: fecal coliform.

- **Department of Ecology, Long Term Marine Water Quality Monitoring Program**

Parameters: fecal coliform, Enterococci, pH, specific conductivity, dissolved oxygen, density, light transmissivity, nutrients, turbidity, color, nitrates, temperature.

- **Jefferson DSHS, Quilcene Bay Water Quality Monitoring (no spatial information) (inactive)**

Parameters: fecal coliform.

- **Department of Ecology, Nonpoint Source Pollution Studies (no spatial information)**

Parameters: fecal coliform, pH, Specific conductivity, dissolved oxygen, toxins, nutrients, turbidity, temperature.

3.0 WATER QUALITY MONITORING PURPOSE AND OBJECTIVES

The goal stated by the WRIA 17 Planning Unit for the Water Quality Monitoring Program is to “identify and support monitoring of ‘leading edge’ indicators of water quality that are both relevant to aquatic ecosystem and human health and pertinent to local natural resource management decision making.”

This water quality monitoring plan is intended to:

- Support and/or suggest needed changes to ongoing water quality monitoring programs by Planning Unit member organizations;
- Support and/or suggest additional information needs for water quality monitoring conducted by state or federal agencies, or other organizations that are not Planning Unit members; and,
- Identify and prioritize additional water quality monitoring opportunities and needs in the planning area.

Primary objectives of water quality monitoring in WRIA 17 are related to the importance of salmon, downstream resources, human health, or the knowledge of existing or potential water quality problems. Specific issues and objectives for surface water, storm water, groundwater, and marine water quality in WRIA 17 are listed below.

3.1 Groundwater Monitoring Objectives

The majority of groundwater monitoring is conducted by the Department of Health under the Drinking Water Program. Other ongoing groundwater monitoring in the watershed are being conducted by agencies including Ecology, USGS, Jefferson County, Clallam County, and an assortment of independent and smaller programs and projects.

The majority of groundwater monitoring is related to Department of Health regulations. Planning efforts for groundwater monitoring require the ability to identify spatially where groundwater monitoring occurs, and the ability to identify the parameters of the monitoring (frequency of sampling, what parameters are sampled, and the period of record for data previously collected). The Technical Committee identified that there is a need to be able to create maps of parameter levels exceeding select water quality standards, to identify sampling dates, and to track trends.

3.2 Surface Water Monitoring Objectives

Land use in the watershed is of a rural nature. In surface water, most water quality problems in the watershed are related to increased temperature and elevated fecal coliform. Twenty stream reaches in the watershed have been placed on the EPA’s 303(d) list for impairment. Causes of these impairments include fecal coliform, temperature, fish habitat, and instream flow. This information is important because it gives an indication of stream health problems throughout the watershed. Stream reaches on the 303(d) list are illustrated in Figure 5. Tabular data describing the listings are available in Table 6.

Surface water objectives cited by the Technical Committee focus mainly on maintaining or improving fish habitat. Surface water monitoring priorities in the watershed were developed by Technical Committee members based on perceived need, known water quality problems or threats, and fisheries habitats. These priorities are illustrated and discussed in Figures 5 through 10 and in Section 4.2 of this report.

In order to understand where sampling schedules are meeting or falling short of needs in the watershed, input was received on reaches that require monitoring in the watershed from the Technical Committee. Parameters that need to be monitored were listed for each reach, then prioritized by the importance or urgency of monitoring that specific parameter at each reach. The Technical Committee provided recommendations for monitoring the following parameters:

- Flow
- Fecal coliform
- TSS, turbidity
- Dissolved Oxygen, pH, Temperature
- Temperature data logger
- Nutrients (Nitrate as nitrogen and total phosphorus as P)

3.3 Stormwater Monitoring Objectives

Stormwater monitoring programs are needed in the following areas: Port Townsend, Port Ludlow, Glen Cove, and the Tri-Area UGA. Parameters to be monitored and the priority for monitoring these were designated by the Planning Unit. These parameters are broken into first, second, and third tier to designate the level of concern (priority) about each parameter and the frequency of its monitoring. This is not to imply that first tier pollutants are more severe than third tier pollutants, only third tier require more expensive sampling and the contaminants are less likely to exist in the rural WRIA 17 watershed. These parameters are as follows:

First Tier:

- Flow;
- Dissolved Oxygen;
- Temperature;
- pH;
- Conductivity, Salinity, or Total Dissolved Solids;
- Turbidity or Total Suspended Solids;
- Fecal Coliform;
- Total Nitrogen; and
- Total Phosphorus.

Second Tier:

- Oil and Grease; and
- Metals – Chromium, Copper, Mercury, Lead, and Zinc.

Third Tier:

- Polycyclic Aromatic Hydrocarbons;
- Herbicides and Pesticides;
- Volatile Organic Compounds;
- Biochemical Oxygen Demand;
- Chemical Oxygen Demand; and
- Full Inorganic.

3.4 Marine Water Monitoring Objectives

Marine water quality monitoring is mainly conducted by the Department of Health, with a few Department of Ecology sites. Priorities of the Water Quality Monitoring Plan for marine water quality focus on fecal coliform bacteria because of its impacts on fisheries and human health. Priority locations for additional marine water quality monitoring were designated by the Technical Committee based on existing conditions and potential threats to watershed health.

3.5 GIS Mapping Product

The need for a spatially-based mechanism to store, analyze, and disseminate monitoring program information was identified by the Technical Committee. To this end, a GIS mapping product was developed for the current and historic water quality sampling programs in the watershed. The mapping product can be used for planning efforts to identify historical or existing sampling locations in surface water, groundwater and marine water.

4.0 WATER QUALITY MONITORING PLAN

The Water Quality Monitoring Plan for WRIA 17 is presented in this section. The monitoring plan includes a summary of applicable water quality regulatory standards, a set of protocols for surface water sampling, proposed revisions to surface and marine water quality monitoring locations, and directives for groundwater quality data management. The monitoring plan also contains the GIS mapping product, which provides spatial coverages of all sampling locations and provides the framework for a centralized spatial water quality database, metadata on sampling programs at each location, and a series of recommendations based on review of the GIS maps and priorities provided by the Technical Committee.

The coordination of sample collection locations and program objectives requires the ability to locate sample locations and place them on a map. The GIS mapping product developed for this plan is a tool that can be used to review existing and historical monitoring programs, and to plan future monitoring activities. The proposed surface and marine monitoring locations provided in this section were identified through comparison of the spatial distribution of sample locations with the prioritized monitoring needs provided by the Technical Committee.

Developing priorities for monitoring programs that involve the revision of existing monitoring programs requires the input from members of the Technical Committee that are well-versed in water quality issues and programs within the WRIA 17 watershed. The intent of this document is to determine whether monitoring programs require deletion, addition or modification based on the needs of the Technical Committee and their constituencies. The only independent determinations included in this plan are for recommended stream reaches for monitoring. These proposed revisions are for the reach to be monitored; determination of specific monitoring locations would require field visits and further consultation within the Technical Committee.

4.1 State Water Quality Standards

Water quality standards for surface waters for the state of Washington are described in Chapter 173-201A of the WAC. Groundwater standards are described in Chapter 173-200 of the WAC. An abbreviated version of surface and groundwater standards is included as Appendix A. Measured parameters should be weighed against state standards as listed in the WAC. Parameters not meeting water quality standards should be reported as such. Particularly in areas where data are available, consistency in meeting state water quality standards will help determine necessity of new gauges and consolidation of existing ones.

4.2 Standard Water Quality Monitoring Protocols

Standard protocols for water sampling are provided in complete detail in the Standard Methods for Examination of Water and Wastewater (American Public Health Association 1998). It is recommended that the methodologies and procedures for sampling groundwater and surface water be based on the guidelines in this manual.

The Washington State Department of Ecology has adopted their own set of standards for stream testing conducted by Ecology. These procedures are included in Appendix B. These protocols were developed by the Department of Ecology for their monitoring programs, and as such were developed for their specific objectives. They are presented in this plan as a guide for consistent sampling methodology. These protocols may not be applicable for certain sampling plan objectives.

This monitoring plan recognizes that there are a wide variety of monitoring programs in WRIA 17, each with varied levels of funding and different reasons for monitoring. Sampling protocol for each program may be limited by funding, time constraints, or other factors. The Department of Ecology sampling protocols are included as a “high” standard.

This plan recommends the creation of a centralized data storage and dissemination product through the provided GIS mapping product. When this centralized database becomes functional, it will be necessary to adopt QA/QC standards to ensure the integrity of data input to that system. Part of the QA/QC will be ensuring that data collection protocols are acceptable and consistent with those for other data to which it might be compared. A tiered approach to these protocol is recommended. The Department of Ecology standards are included as a starting point (the highest tier). Other protocol would likely be established as the database becomes utilized (for example, screening methodologies provide valuable data, but typically at a lower sampling standard. Screening data should be considered acceptable for their respective sampling objectives, but may not be considered acceptable to a more exacting sampling standard).

In the event that a centralized database is developed, the level or standard of sampling protocol used in data collection should be recorded in the database with a qualifier correlated with the state standard as the “high” standard.

4.3 GIS Mapping Product

As described in Section 3, the Technical Committee identified the need for a centralized coordinated mapping tool for water quality planning and coordination. A GIS mapping product containing the monitoring program information collected throughout the watershed is included in Appendix C of this report. The GIS mapping product was developed using spatial information for sampling locations that were supplied by monitoring agencies. In many cases, sampling locations were only recorded on paper maps, and digitizing was necessary to input the locations into the GIS mapping product. In other instances, coordinates or spatial data files were provided and were input to the GIS. The resolution of the sampling locations in this product is dependant upon the level of accuracy of the coordinates provided. The information collected about current and historic sampling programs is also included in the mapping product in the attribute table for each data layer, where available. Specific uses of the mapping product are described in Section 4.

Information includes sample locations for historic and existing water quality sampling programs for surface water, groundwater and marine water. The format of the GIS is views, which allow the user to look at spatial distribution of monitoring locations. Each file with the sampling locations also contains information at monitoring conducted at each site in a table. Data could be added to these tables or linked to these tables if data are to remain in a separate location. Topography, land cover, or other GIS data layers can be added to the GIS mapping product to provide a comparison of water quality monitoring in specific physical or land use areas of interest.

The tables pertaining to each monitoring program stored in the GIS mapping product allows the viewer to access monitoring program information and data collection activities that have occurred at any specific location. For example, a planner can review a map of surface water sampling on Chimacum Creek, click on a specific sample collection point, and view parameters sampled, sampling frequency, and other information available for that sample location. The information available in the attribute table for specific sample locations may include a list of the parameters analyzed at that location, frequency of data collection, periods of record, and other data. Detailed information other than spatial locations was not provided for all sampling programs, usually due to incomplete GIS

coverage. If these data area collected or made available, they could readily be added to the attribute tables in the GIS mapping product.

Water quality data are not currently included in the GIS mapping product, as actual parameter data were not collected as part of this project. A water quality database for groundwater, marine, and surface water data could be developed and linked to the mapping tool to provide a more advanced level of coordination of water quality assessment efforts. With the addition of water quality data, the mapping tool could be used to map water quality trends, to map areas that are outside of water quality standards, or to allow evaluation of the spatial distribution of parameters levels measured.

The addition of a centralized water quality database would require compilation of water quality data for each applicable sampling program, and likely some extensive data management to coordinate the data structures. It would be necessary to review and analyze data tables for consistent structures, and to ensure that fields in the data tables are in the appropriate consistent formats for inclusion in the database. A consistency analysis of the data would be required to ensure that all parameters are reported in the same manner (for example, conductivity can be reported as “conductivity” or as “specific conductance.” If it is not reported consistently, it can not be queried accurately from the database).

Addition of other data would also require QA/QC capability and protocol by the agency or individual in charge of coordinating the database. This QA/QC protocol would include data collection methods, laboratory certification, and data reporting limits. QA/QC protocol would assure data quality and would allow for cross referencing and comparison of data from various programs in the database.

New data tables can be joined to specific layers of the GIS mapping product through a query function using a common “key” field. Specific steps to creating the joined database vary depending on the format of the existing groundwater quality data. Once the data are joined, data can then be sorted and queried for any needed information, such as sampling date, samples above regulatory standards, etc. Answers to these queries can be displayed on the GIS product, tying the spatial and parameter data together.

4.4 Groundwater Monitoring

The primary agency conducting groundwater monitoring in the watershed is the Washington State Department of Health. Groundwater monitoring is also conducted by Ecology, Jefferson County, Clallam County, USGS, and other organizations. Groundwater monitoring is conducted in the watershed for a number of reasons, but the majority of sampling is of group A and B wells for drinking water standards. Revisions to these programs are not recommended, however, revisions in the way that groundwater quality data is managed and archived are proposed. These proposed revisions are discussed below.

4.4.1 Groundwater Quality Proposed Revisions

The GIS maps in Figures 1 and 2 provide a preliminary analysis of site co-location (proximity to one another). The GIS mapping product was used to identify areas where redundancy occurs for groundwater sample collection and to make proposed revisions that reduce redundancy in sample collection. Specific sampling objectives were matched to specific sampling locations to identify the redundancies occurring throughout the watershed.

Jefferson County monitors the bulk of the groundwater sampling locations in WRIA 17. Most of the Jefferson County wells are not located near wells used in other data collection programs, thus there are few areas where redundancy can be reduced. However, there is a possibility of coordination of Jefferson County groundwater monitoring with other similar programs via a review of the specific sampling and analytical parameters for these wells.

Marrowstone Island has a great deal of sampling redundancy for a variety of reasons. Sample coordination in that area would likely improve efficiency and cost savings to the involved parties if the sampling objectives in that area are similar.

Sample locations are well dispersed around Sequim Bay, although redundant sampling by Clallam County, Ecology, and USGS occur there. Some redundant sample locations occur in the vicinity of the Little Quilcene River, Quilcene and East Quilcene, and the head from Squamish Harbor to Port Ludlow indicate areas where coordination may potentially improve sampling efficiency.

A majority of the groundwater monitoring conducted in WRIA 17 is done by mandate by the Washington State Department of Health, and as such can not be revised to any great extent. Furthermore, specific sampling objectives for non-mandated groundwater sampling were not provided, therefore can not be evaluated in this plan. It is proposed that the groundwater data be managed using the GIS mapping product. With this mapping product, agencies can begin to tie spatial relationships to their groundwater monitoring data and can readily track groundwater sampling activities and plan future sampling events. This is proposed, particularly with WDOH groundwater data, to allow the tracking of parameters that exceed their respective regulatory standards, and to schedule sampling dates.

4.5 Surface Water Monitoring

Surface water monitoring programs in the Quilcene watershed were reviewed and mapped to identify overlapping efforts, overlooked areas, and to identify areas where monitoring is not consistent with needs identified by the Technical Committee. These activities are described below.

Figure 3 illustrates surface water monitoring locations in the Quilcene watershed. From this illustration, it is clear that monitoring stations overlap in places, such as Chimacum Creek. It was necessary to assess specific parameters analyzed at each site, and the specific objectives for each sampling program to develop a coordinated monitoring plan. With the GIS product that was created with this plan, sites were queried and sorted by parameters measured and frequency of monitoring.

Based on information received from the Technical Committee, streams were prioritized as high, medium, and low for each parameter, as described in Section 3.2. Technical Committee members provided a list of streams on which monitoring is needed (inclusive of those on which monitoring is currently occurring) and a list of parameters that are important to monitor in the watershed. At each stream, the importance (priority) of monitoring each parameter was given by the Technical Committee (high, medium, low).

These priorities were input to the GIS mapping product that was developed in the metadata collection phase of this project in order to illustrate priorities in the watershed and existing monitoring locations for relevant parameters. Maps with relevant sampling locations plus priority locations were created for each parameter, and are presented in Figures 6 through 11. In these figures, sampling sites that currently monitor the parameter specified are noted in yellow. Sampling sites that are active but do not monitor the specific parameter highlighted in the figure are presented in blue. Inactive (historic)

monitoring locations that may or may not have historically monitored the specific parameter are presented in grey.

Additional sampling needs were assessed throughout the watershed, based on a comparison of monitoring needs cited by the Technical Committee and existing programs, and are explained in this monitoring plan. With this monitoring needs assessment, it is important to note that water quality monitoring concerns of the Technical Committee are in the interest of fisheries habitat. Fish barriers are not noted on the GIS maps, although it is assumed that fish do not travel into the steeper headwater sections of the watershed. Sampling locations in the reach above the anadromous zone are generally unnecessary, even though the full extent of some streams is marked as priority sampling locations.

Figures 6 through 11 are presented as a tool that was used to develop proposed sampling locations. Using these maps, the following proposed revisions were made for additional monitoring in WRIA 17. Proposed revisions for sampling locations and parameters are explained in the text below, and are explained in further detail in Table 9. An overview of current and proposed monitoring for stream reaches that were given a priority for monitoring, and proposed additional gauging are also presented in Table 9.

Figure 12 presents an illustration of the proposed stream sampling locations and parameters. This figure includes existing and inactive monitoring locations, and indicates the agencies overseeing the monitoring at each gauge. The waterbodies prioritized for monitoring by the Technical Committee are highlighted, and proposed additional monitoring is summarized in numbered boxes for each prioritized stream. The numbers represent the parameters that are proposed to be added to existing gauges. The colors of the numbers represent priority assigned for each parameter (low, medium, high). This information is cross-referenced in Table 9.

4.5.1 Flow – High Priority

Figure 6 illustrates priorities listed by the Technical Committee for flow monitoring and existing sampling locations. Flow, air temperature, and water temperature monitoring on all eight streams listed as high priority for flow monitoring by the Technical Committee is jointly conducted by Ecology and Jefferson County Natural Resource Division. Continuous data is logged and transmitted. Near real-time data is available on Ecology's website. There are no proposed additional monitoring locations for stream flow. Detailed information on medium and low priority reaches for stream flow is available in Table 9.

High Priority Flow Monitoring

Current Monitoring	Proposed Additional Monitoring
Big Quilcene River	None
Chimacum Creek	
Jimmycomelately Creek	
Little Quilcene River	
Salmon Creek	
Snow Creek	
Tarboo Creek	
Thorndyke Creek	

4.5.2 Fecal Coliform – High Priority

Figure 7 illustrates priorities listed by the Technical Committee for fecal coliform monitoring and existing sampling locations. Figure 12 illustrates proposed additional monitoring locations. Additional high priority fecal coliform monitoring needs are listed below.

It is proposed that fecal coliform monitoring be added to the S’Klallam Tribe gauge at Shine Creek and to the Ecology gauge at Jimmycomelately Creek. It is also proposed that fecal coliform monitoring be added to the S’Klallam Tribe gauge at Jackson Creek, which was not prioritized, but is on the 303(d) list for fecal coliform. Johnson Creek is also not prioritized, but is on the 303(d) list, and a new gauge for fecal coliform should be added on this creek. The Little Quilcene River is currently monitored for fecal coliform at the mouth. However it is proposed that fecal coliform monitoring be added to the Port Townsend gauge upstream on the Little Quilcene River. Detailed information on medium and low priority reaches for fecal coliform is available in Table 9.

High Priority Fecal Coliform Monitoring

Current Monitoring	Proposed Additional Monitoring
Big Quilcene River	Jackson Creek (303(d) listed)
Chimacum Creek	Jimmycomelately Creek
East Chimacum Creek	Johnson Creek (303(d) listed)
Little Quilcene River (downstream)	Little Quilcene River (upstream)
Naylor's Creek	Ludlow Creek
Putansuu Creek	Shine Creek
Salmon Creek	
Snow Creek	
Tarboo Creek	

4.5.3 TSS, Turbidity – High Priority

Figure 8 illustrates priorities listed by the Technical Committee for total suspended solids and/or turbidity monitoring and existing sampling locations. Figure 12 illustrates additional monitoring needs. The current and proposed additional high priority total suspended solids and/or turbidity monitoring needs are listed below.

New gauges are proposed at Houck Creek, Indian George Creek, Townsend Creek, Trapper Creek, and Tunnel Creek. Addition of TSS/Turbidity to existing Ecology gauges is proposed at Andrews Creek and Jimmycomelately Creek. Addition of TSS/Turbidity to the Jefferson County gauge is proposed at Jakeway Creek. Addition of TSS/Turbidity to existing S'Klallam Tribe gauges is proposed at the remainder of the waterbodies. Detailed information on medium and low priority reaches for TSS/Turbidity is available in Table 9.

High Priority TSS and Turbidity Monitoring

Current Monitoring	Proposed Additional Monitoring
Big Quilcene River	Andrews Creek
Chimacum Creek	Houck Creek
Donovan Creek	Indian George Creek
East Chimacum Creek	Jakeway Creek
Leland Creek	Jimmycomelately Creek
Little Quilcene River	Marple Creek
Ludlow Creek	Penny Creek
Naylors Creek	Ripley Creek
Salmon Creek	Shine Creek
Snow Creek	Spencer Creek
Tarboo Creek	Townsend Creek
Thorndyke Creek	Trapper Creek
	Tunnel Creek

4.5.4 Dissolved Oxygen, pH, Temperature (grab) – High Priority

Figure 9 illustrates priorities listed by the Technical Committee for dissolved oxygen, pH, and temperature (grab sampling) and existing sampling locations. Figure 12 illustrates proposed additional monitoring needs. Some of these locations are currently monitored for temperature only. These locations only require addition of dissolved oxygen and pH. Additional high priority dissolved oxygen, pH, and temperature (grab sample) monitoring needs are listed below.

Addition of dissolved oxygen and pH to Ecology gauges is proposed at Andrews Creek, Jimmycomelately Creek, and Shine Creek. Addition of dissolved oxygen, pH, and Temperature is proposed for the Jefferson County gauges in Barnhouse Creek and Jakeway Creek. Addition of dissolved oxygen and pH monitoring to the current S’Klallam Tribe temperature gauges is proposed for the remainder of the waterbodies. Detailed information on medium and low priority reaches for dissolved oxygen, pH, and temperature monitoring is available in Table 9.

High Priority Dissolved Oxygen, pH, and Grab Temperature Monitoring

Current Monitoring	Proposed Additional Monitoring
Big Quilcene River	Andrews Creek (DO, pH only)
Chimacum Creek	Barnhouse Creek
Donovan Creek	Jakeway Creek
East Chimacum Creek	Jimmycomelately Creek (DO, pH only)
Leland Creek	Shine Creek (DO, pH only)
Little Quilcene River	
Naylor's Creek	
Salmon Creek	
Snow Creek	
Tarboo Creek	
Thorndyke Creek.	

4.5.5 Continuous Temperature Monitoring – High Priority

A thorough stream temperature monitoring program was begun by the S'Klallam Tribe in 1992 and is still currently active. This program monitors temperature with data loggers at 29 locations within the watershed. The most severe temperature violations in the WRIA 17 watershed have occurred on Chimacum Creek, with less severe violations occurring on Gamble, Leland, Ripley, Howe, Tarboo, and East Fork Chimacum Creeks.

Particularly in the case of temperature, where much historical data exists, it is beneficial to continue the monitoring at many sampling locations on Chimacum Creek, even though they are nearby each other, because of that stream's historically elevated temperatures and its importance as anadromous fisheries habitat. Temperature measurements in streams should be consistent with the standards set forth by the State and by the S'Klallam Tribe's temperature monitoring program.

Figure 10 illustrates priorities listed by the Technical Committee for continuous temperature monitoring and existing sampling locations. Figure 12 illustrates additional monitoring needs. Detailed information on medium and low priority reaches for continuous temperature monitoring is available in Table 9.

Since the S'Klallam tribe oversees a relatively thorough stream temperature program, there are few additional data needs. A new sampling station is proposed at Contractors Creek.

High Priority Continuous Temperature Monitoring

Current Monitoring	Proposed Additional Monitoring
Andrews Creek	Contractors Creek
Big Quilcene River	
Chimacum Creek	
Donovan Creek	
East Chimacum Creek	
Jakeway Creek	
Jimmycomelately Creek	
Leland Creek	
Little Quilcene River	
Naylors Creek	
Salmon Creek	
Snow Creek	
Tarboo Creek	
Thorndyke Creek	

4.5.6 Nitrogen and Phosphorus – High Priority

Figure 11 illustrates priorities listed by the Technical Committee for nitrogen and phosphorus monitoring and existing sampling locations. Figure 12 illustrates additional monitoring needs for these parameters. Additional high priority nitrogen and phosphorus monitoring needs are listed below. Detailed information on medium and low priority reaches for stream flow is available in Table 9.

The addition of nutrient monitoring is proposed for the existing Ecology station at Jimmycomelately Creek and the existing Jefferson County site at Barnhouse Creek.

High Priority Nitrogen and Phosphorus Monitoring

Current Monitoring	Proposed Additional Monitoring
East Chimacum Creek	Barnhouse Creek
Little Quilcene River	Jimmycomelately Creek
Naylors Creek	
Snow Creek	
Tarboo Creek	

4.5.7 Surface Water Quality Index

It is proposed that, where possible, a standard set of parameters be adopted across sampling locations. This would fulfill priorities listed above and would also allow for the comparative assessment of parameters across sites. In 2002, the Department of Ecology released the “Water Quality Index for Ecology’s Stream Monitoring Program.” This is an index that facilitates comparison of water quality between waterbodies and eases dissemination of water quality status to the public. While it is realized that this index (or any index) has shortcomings stemming from generalizations that are inherently made, the index can also be a useful tool. In every case, site specific decisions should never be made solely based on the index standing. However, it is a useful tool for comparing between waterbodies.

Ecology’s Water Quality Index uses eight parameters measured monthly to arrive at an index value. These are: temperature, dissolved oxygen, pH, fecal coliform, total nitrogen, total phosphorus, total suspended sediment, and turbidity.

In an effort to compare water quality throughout the watershed and across watersheds, it is proposed that water quality monitoring be conducted in a manner that is consistent with application of the Water Quality Index. Since these parameters are already measured with most sampling programs in the watershed, this does not call for a change of existing programs, simply coordination of new or modified programs. Input of data to the Water Quality Index is optional, but may be helpful in future studies.

4.6 **Stormwater Monitoring Program**

The Technical Committee prioritized having a Stormwater monitoring program in four locations within the watershed:

- City of Port Townsend,
- Port Ludlow,
- Glen Cove, and
- Tri-Area Urban Growth Area.

A comprehensive stormwater monitoring program currently exists at Port Ludlow. This study works with the objectives to:

- “Establish baseline water quality conditions;
- Evaluate the impacts of development activities and related non-point sources;
- Evaluate the effectiveness of non-point source controls such as Stormwater management systems; and
- Monitor long-term trends of bay water quality.” (Aquatic Research, 2003).

The Port Ludlow monitoring program has been in effect since 1989. Baseflow monitoring includes eight sites where the following parameters are measured monthly:

- Flow,
- pH,
- Temperature,

- Specific conductivity,
- Dissolved oxygen,
- Turbidity, and
- Fecal coliform

Stormwater monitoring occurs about once per year at twelve to eighteen sites. Parameters measured from stormwater include all baseflow parameters plus:

- Total suspended solids,
- Total petroleum hydrocarbons,
- Total and soluble reactive phosphorus,
- Nitrate + nitrite, ammonia, total Kjeldahl nitrogen,
- Hardness,
- Total and dissolved copper,
- Lead,
- Zinc, and
- Iron.

Parameters measured in both stormwater and baseflow sampling in the Port Ludlow non point source monitoring program were listed as priorities for new stormwater sampling programs in areas where the programs are to be initiated. The Water Quality Monitoring Plan proposes modeling the Glen Cove, Port Townsend, and Tri-Area UGA stormwater programs after the Port Ludlow program. This would provide a framework for the programs, and would also facilitate comparison between samples from each urban or urbanizing area. Sampling locations in each urban/urbanizing area will be dependant upon localized land use, sampling methods, and feasibility. Figure 13 shows the areas where stormwater monitoring is proposed. Land cover data for the watershed to show areas with land uses that might affect stormwater quality. Land cover data was obtained from the USGS 1992 National Land Cover Database, which produced the data by classifying a 1992 Landsat Thematic Mapper satellite image. This image is of 30 meter resolution.

Additional samples that could be monitored as a part of the stormwater monitoring programs are those listed as last priority by the Technical Committee:

- Polycyclic aromatic hydrocarbons,
- Herbicides and pesticides,
- Volatile organic compounds,
- Biochemical oxygen demand,
- Chemical oxygen demand, and
- Full inorganic chemicals list.

Based on a recommendation in report of the Port Ludlow program (Aquatic Research, 2003) that pesticide sampling be discontinued based on lack of need in the area, it is proposed that the addition

of pesticide sampling to the stormwater sampling programs at other locations be based on localized concerns and land uses.

4.7 Marine Water Quality Monitoring

Current marine water quality monitoring locations, as well as locations designated by the Technical Committee as being important to monitor, are illustrated in Figure 4. Since the objectives of the Water Quality Monitoring Plan focus on fisheries habitat and anthropogenic impacts, the key parameter of concern in marine water fecal coliform. The majority of marine water quality sampling is conducted by the Washington Department of Health (WDOH), which monitors fecal coliform levels as a part of the Recreational Shellfish and other programs. In general, WDOH samples growing areas five to six times per year at multiple stations and from this data determines the status, trend, and appropriate management classification for a shellfish area (personal communication with Technical Committee). Based on WDOH monitoring results, most shellfish areas in the Quilcene watershed are considered healthy, with only a few showing some limited threat from upland stormwater runoff. The WDOH conducts periodic shoreline surveys to identify bacterial contamination sources, but only has staff resources to complete these at six to ten year intervals.

4.7.1 Marine Water Quality Proposed Revisions

This monitoring plan cannot suggest changes to the WDOH sampling programs, but can propose additional sampling. From the WDOH monitoring results, only Quilcene Bay shows a demonstrated worsening trend (personal communication with Technical Committee), with six of nine stations showing a worsening trend over the period of 1995-2001. In this area, the Water Quality Plan proposes more detailed source tracking monitoring of fecal coliform contamination to locate and remedy problems before conditions worsen further.

It is also proposed that monitoring locations be added in priority areas where sampling is not currently occurring. High priority monitoring for marine water was only assigned by the Technical Committee to one area, near Quilcene, where monitoring is currently being conducted. However, the Technical Committee cited three medium priority areas for monitoring, two on the east side of Discovery Bay and one near Port Townsend, have little or no monitoring. Sampling should be expanded in these areas.

5.0 RECOMMENDATIONS

The monitoring plan provided in Section 4 gives directions for expansion and coordination of current and future water quality monitoring efforts. Future options for developing coordination, data sharing, and public outreach capabilities of the water quality monitoring program in the Quilcene watershed are discussed below. The following recommendations are provided to assist in the implementation of the monitoring plan, and to improve on existing products and resources provided in this report.

5.1 Creation of a dynamic GIS/Access database product

The GIS mapping product provided in Appendix C of this report can serve as the framework for future creation of a dynamic GIS/Access database product for water quality data management and illustration of water quality trends and levels. This option would link a relational Access database to GIS maps to provide a standard viewing and updating mechanism for the data and sampling locations. Data in the GIS product would be updated automatically as it is input to the Access database, and would be immediately viewable via “point and click” access to the GIS product. This would not only provide a method for viewing and assessing data gaps and overlays, but may also be a useful and efficient data cataloguing framework for all agencies and groups involved.

Steps necessary to complete data gathering for the GIS/Access product include producing a standardized format for data storage and notation (i.e. consistent abbreviations across databases and consistent units for each parameter). Once this standardized format is formulated, all available water quality data would be collected and input to the access database. This database would then be linked to the compiled information in the ArcView project to produce a dynamic interactive database. This product would require the assignment of responsibility for upkeep and maintenance of the database to an individual or agency, and would require standardization of reporting and sampling procedures across monitoring agencies and organizations. This database would also require the adoption of data standards, by which only data that is collected and analyzed by an approved method would be included in the database.

5.2 Development of a Web Page

The dynamic GIS/Access database can be posted to an internet/intranet site where a limited number of individuals may be provided secure access to update the catalog, and where a broader set of individuals may view the catalog on a read-only basis. This would be effective both as a tool for coordination and communication between agencies, and for public outreach and education.

5.3 Further Analysis of Monitoring Locations

The first step toward coordination of monitoring efforts was the creation of the GIS Mapping Product and the development of monitoring priorities by the Technical Committee. Now that this information is stored in a centralized GIS system, further analysis of monitoring locations can be conducted using drainage area delineation functionality of a GIS product, as well as land cover data, parcel data, and stormwater drainage network data (where available). These analyses will allow the user to visually demonstrate which areas are receiving waters for different potential pollutants and potentially hazardous land uses, and assign monitoring locations accordingly.

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TABLES

Organizations

Organization	Organization Name	Parent Organization	Web Page
Jefferson	Jefferson County		www.co.jefferson.wa.us
Jefferson CD	Jefferson County Conservation District	Jefferson	
PNPTC	Point No Point Treaty Council	Tribal	
Ecology	Washington Department of Ecology	Washington	http://www.ecy.wa.gov/
WDFW	Washington Department of Fish and Wildlife	Washington	http://www.wa.gov/wdfw/
DOH	Washington Department of Health	Washington	http://www.doh.wa.gov/
USFS	U.S. Forest Service	US DOI	
USGS	U.S. Geological Survey	US DOI	
USEPA	U.S. Environmental Protection Agency	USA	
Jefferson NR	Jefferson County Natural Resources	Jefferson	
Jefferson PUD	Jefferson County Public Utilities Department	Jefferson	
DNR	Washington Department of Natural Resources	Washington	http://www.wa.gov/dnr/
S'Klallam	Port Gamble S'Klallam Tribe	Tribal	
NRCS	National Resources Conservation Service		
NOAA	National Oceanic & Atmospheric Administration	US DOC	http://www.noaa.gov
Port Townsend	City of Port Townsend		
USFW	U.S. Fish and Wildlife	US DOI	http://www.fws.gov
Jefferson DSHS	Jefferson County Department of Social and Health Services	Jefferson	
Jefferson PBD	Jefferson County Planning and Building Department	Jefferson	
USDA	U.S. Department of Agriculture	USA	http://www.usda.gov
PSAMP	Puget Sound Ambient Monitoring Program	PSWQAT	http://www.wa.gov/pswqat/Programs/PSAMP.htm
PSWQAT	Puget Sound Water Quality Action Team	PSWQMP	http://www.wa.gov/puget_sound/
PSWQMP	Puget Sound Water Quality Management Plan	Washington	
Jefferson EHD	Jefferson County Environmental Health Department	Jefferson	http://www.co.jefferson.wa.us/envhealth/default.htm
Clallam HD	Clallam County Health Department	Clallam	http://www.clallam.net/EnvHealth/
MISC	Miscellaneous Organizations		

Contacts

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Programs

Organization	Monitoring Program or Dataset	Active?	Obtained Station Data?	Period of Record	Type of Program (freshwater, marine, groundwater, mapping, other)	Types of Monitoring (continuous, intermittent, as-needed, once-only, other)	Fecal Coliform	Total Coliform	Enterococci	<i>E. Coli</i>	Blue/Green Algae	PSP	ASP	<i>Vibrato</i>	pH	SW Salinity/ Conductivity	Dissolved Oxygen	Density	Light Transmission	Toxics	Nutrients	Turbidity/TSS	Color	Nitrate	Chloride	Iron, Manganese	Sediment Chemistry
Clallam HD	Drinking Water Program	Y	Y		Groundwater																			x	x		
DOH	PWS Water Quality Monitoring	Y	Y		Database	As-needed															x	x	x	x	x	x	
DOH	Biotoxin/Shellfish Program (Includes: Commercial Shellfish Licensing, Food Safety and Shellfish, Recreational Shellfish, Shellfish Growing Area Classification Programs)	Y	N		Marine		x					x	x	x						x							
Ecology	River and Stream Water Quality Monitoring Program	Y	Y		Freshwater																						
Ecology	Water Quality Program	Y	Y		Freshwater, Marine, Groundwater																						
Ecology	Water Quality - Big Quilcene R nr Mouth	Y	Y	2000 to 2001	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Water Quality - Big Quilcene R nr Quilcene	N	Y	1959-66, 1972-74, 1994, 1999	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Water Quality - Chimacum Cr nr Irondale	N	Y	1994	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Water Quality - Chimacum Cr @ Hadlock	N	Y	1973	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Water Quality - Chimacum Cr @ Chimacum	N	Y	1994	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Water Quality - Chimacum Cr nr Chimacum	N	Y	1973	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Water Quality - Jimmycomelately Cr nr Mouth	Y	Y	2000 to Present	Freshwater	Intermittent	x								x	x	x				x	x					
Ecology	Groundwater Quality Program	Y	Y		Groundwater	Intermittent																		x	x		
Ecology	River and Streamflow Monitoring Program	Y	Y		Freshwater																						
Ecology	Streamflow -Little Quilcene nr Mouth	Y	Y	Sept 2002 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Big Quilcene R. nr Mouth	Y	Y	Oct 1998 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Jimmycomelately Cr nr Mouth	Y	Y	Oct 1999 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Snow Creek @ WDFW	Y	Y	Sept 2002 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Salmon Ck. @ West Uncas Rd.	Y	Y	Sept 2002 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Tarboo Ck. nr Mouth	Y	Y	April 2003 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Thorndyke Ck. nr Mouth	Y	Y	April 2003 to Present	Freshwater	Intermittent																					
Ecology	Streamflow -Chimacum Ck. nr Mouth	Y	Y	April 2003 to Present	Freshwater	Intermittent																					
Ecology	Long-term Marine Water Quality Monitoring Program	Y	Y	1973 to Present	Marine	Variable	x		x						x	x	x	x	x		x	x	x	x			
Jefferson CD	Water Quality and Fish Monitoring Program - Station Locations for active sites only	Y	Y	1986 to Present	Freshwater																						
Jefferson CD	Surface Water Quality Database- No Station Locations	Y	Y	1986 to Present	Freshwater Database		x	x	x						x	x	x				x	x		x			
Jefferson DSHS	Quilcene Bay Water Quality Monitoring- Not Mapped	N	N	1984	Marine		x																				
Jefferson EHD	Drinking Water Program (well permitting data)	Y	Y		Groundwater																			x	x		
Jefferson PBD	Ludlow Watershed Water Quality Monitoring	N	N	1991 to 1992	Freshwater																						
Pacific Ecological Inst.	Leland Citizens Monitoring Project	Y	Y	unknown	Freshwater	Continuous	x								x	x	x				x						
Pope Resources	Port Ludlow Non-Point Monitoring Program	Y	Y	1989 to Present	Freshwater	Intermittent	x								x	x	x				x	x	x			x	
Port Ludlow Assoc.	Port Ludlow Area Groundwater Monitoring Program	Y	Y	April 1994 to Present	Groundwater	Anually																			x		
Port Townsend	Port Townsend Monitoring- Big Quilcene	Y	Y	1993-present	Freshwater										x	x					x	x	x	x	x		x
Port Townsend	Port Townsend Monitoring- Little Quilcene	Y	Y	1993-present	Freshwater										x	x					x	x	x	x	x		x
Port Townsend	Streamflow - Little Quilcene River at Diversion	Y	N	1994 to 1999	Freshwater	Continuous																					
Port Townsend	Streamflow - Chimacum Creek	Y	N	1998 to Present	Freshwater	Continuous																					
S'Klallam	Stream Temperature Monitoring Program	Y	Y		Freshwater																						
USDA	Pacific Northwest Regional Water Quality Program - No Sites in WRIA 17		N																								
USEPA	STORET Legacy Data Center - Water Quality Data Database (River Miles)	N	Y	Pre-1999	Database (Freshwater, Marine, Groundwater, Outfall)																						
USEPA	STORET (River Miles)		N	1999 to Preset	Database (Freshwater, Marine, Groundwater, Outfall)											x	x			x	x	x	x	x			
USFS	Quilcene Water Quality Monitoring		N	1983 to 1993	Freshwater																						
USGS	National Streamflow Information Program	Y	Y		Freshwater																						

Programs

Organization	Monitoring Program or Dataset	Active?	Obtained Station Data?	Period of Record	Type of Program (freshwater, marine, groundwater, mapping, other)	Types of Monitoring (continuous, intermittent, as-needed, once-only, other)	Fecal Coliform	Total Coliform	Enterococci	<i>E. Coli</i>	Blue/Green Algae	PSP	ASP	<i>Vibrato</i>	pH	SW Salinity/ Conductivity	Dissolved Oxygen	Density	Light Transmission	Toxics	Nutrients	Turbidity/TSS	Color	Nitrate	Chloride	Iron, Manganese	Sediment Chemistry
USGS	Streamflow - Little Quilcene River Nr Quilcene, Wash.	N	Y	1927 to 1957	Freshwater	Intermittent																					
USGS	Streamflow - Snow Creek Near Maynard, Wash.	N	Y	1952 to 1979	Freshwater	Intermittent																					
USGS	Streamflow - Chimacum Creek Nr Chimacum, Wash.	N	Y	1952 to 1957	Freshwater	Intermittent																					
USGS	Streamflow - Big Quilcene River Below Diversion Nr Quilcene, WA	Y	Y	1994 to Present	Freshwater	Intermittent																					
USGS	Streamflow - Penny Creek Near Quilcene, Wash.	N	Y	1986 to 1987	Freshwater	Intermittent																					
USGS	Streamflow - Big Quilcene River Nr Quilcene, WA	N	Y	1971 to 1972	Freshwater	Intermittent																					
USGS	Groundwater Quality Monitoring Program	Y	Y		Groundwater Database										x						x			x	x		
USGS	Water Quality - Chimacum Creek Nr Chimacum, Wash.	N	Y	1973	Freshwater	Intermittent		x							x	x	x				x		x	x	x		
USGS	Water Quality - Big Quilcene River Nr Quilcene, WA	N	Y	1959 to 1974	Freshwater	Intermittent		x							x	x	x				x		x	x	x		
USGS	Puget Sound National Water Quality Assessment (NAWQA)- No Sites in WRIA 17		N		Database																						

Programs																																						
Organization	Monitoring Program or Dataset	Inorganic Compounds	Semi-Volatiles	Volatiles	GW Salinity/ Conductivity	Water Temperature	Streamflow	Outfalls	Aquifer Levels	Lake Levels	Hydro- dynamic	Precipitation	Air Temperature	Wind	Evaporation	Remote Sensing	Watershed Boundaries	Land Use	Hazards	Hydrology	Topography	Stream Habitat	Riparian Characteristics	Morphology	Beaches	Hydro-modifications	Fish Passage Barriers	Well Locations	Salmon (adult)	Salmon (juvenile)	Shellfish	Benthic macro-invertebrates	Marine Veget./ Algae	Marine Mammals	Plants	Birds	Infaunal Benthic	Other Fish Species
Clallam HD	Drinking Water Program																																					
DOH	PWS Water Quality Monitoring				x																																	
DOH	Biotoxin/Shellfish Program (Includes: Commercial Shellfish Licensing, Food Safety and Shellfish, Recreational Shellfish, Shellfish Growing Area Classification Programs)																														x							
Ecology	River and Stream Water Quality Monitoring Program																																					
Ecology	Water Quality Program																																					
Ecology	Water Quality - Big Quilcene R nr Mouth					x	x																															
Ecology	Water Quality - Big Quilcene R nr Quilcene					x	x																															
Ecology	Water Quality - Chimacum Cr nr Irondale					x	x																															
Ecology	Water Quality - Chimacum Cr @ Hadlock					x	x																															
Ecology	Water Quality - Chimacum Cr @ Chimacum					x	x																															
Ecology	Water Quality - Chimacum Cr nr Chimacum					x	x																															
Ecology	Water Quality - Jimmycomelately Cr nr Mouth					x	x																															
Ecology	Groundwater Quality Program																																					
Ecology	River and Streamflow Monitoring Program																																					
Ecology	Streamflow -Little Quilcene nr Mouth						x																															
Ecology	Streamflow -Big Quilcene R. nr Mouth						x																															
Ecology	Streamflow -Jimmycomelately Cr nr Mouth					x	x					x																										
Ecology	Streamflow -Snow Creek @ WDFW						x																															
Ecology	Streamflow -Salmon Ck. @ West Uncas Rd.						x																															
Ecology	Streamflow -Tarboo Ck. nr Mouth						x																															
Ecology	Streamflow -Thorndyke Ck. nr Mouth						x																															
Ecology	Streamflow -Chimacum Ck. nr Mouth						x																															
Ecology	Long-term Marine Water Quality Monitoring Program					x																																
Jefferson CD	Water Quality and Fish Monitoring Program - Station Locations for active sites only																																					
Jefferson CD	Surface Water Quality Database- No Station Locations					x	x																															
Jefferson DSHS	Quilcene Bay Water Quality Monitoring- Not Mapped																																					
Jefferson EHD	Drinking Water Program (well permitting data)																																					
Jefferson PBD	Ludlow Watershed Water Quality Monitoring															</																						

Programs																																							
Organization	Monitoring Program or Dataset	Inorganic Compounds	Semi-Volatiles	Volatiles	GW Salinity/ Conductivity	Water Temperature	Streamflow	Outfalls	Aquifer Levels	Lake Levels	Hydro- dynamic	Precipitation	Air Temperature	Wind	Evaporation	Remote Sensing	Watershed Boundaries	Land Use	Hazards	Hydrology	Topography	Stream Habitat	Riparian Characteristics	Morphology	Beaches	Hydro-modifications	Fish Passage Barriers	Well Locations	Salmon (adult)	Salmon (juvenile)	Shellfish	Benthic macro- invertebrates	Marine Veget./ Algae	Marine Mammals	Plants	Birds	Infaunal Benthic	Other Fish Species	
USGS	Streamflow - Little Quilcene River Nr Quilcene, Wash.						x																																
USGS	Streamflow - Snow Creek Near Maynard, Wash.						x																																
USGS	Streamflow - Chimacum Creek Nr Chimacum, Wash.						x																																
USGS	Streamflow - Big Quilcene River Below Diversion Nr Quilcene, WA						x																																
USGS	Streamflow - Penny Creek Near Quilcene, Wash.						x																																
USGS	Streamflow - Big Quilcene River Nr Quilcene, WA						x																																
USGS	Groundwater Quality Monitoring Program	x			x				x																														
USGS	Water Quality - Chimacum Creek Nr Chimacum, Wash.	x				x	x																																
USGS	Water Quality - Big Quilcene River Nr Quilcene, WA	x				x	x																																
USGS	Puget Sound National Water Quality Assessment (NAWQA)- No Sites in WRIA 17																																						

TABLE 4
Program Information

Organization	Monitoring Program or Dataset	Monitoring Program or Dataset	Location Summary	Purpose of Program	Program URL	Methods URL	Data Format
Clallam HD	Drinking Water Program	Drinking Water Program	Clallam	Monitor drinking water quality in Clallam County	http://www.clallam.net/EnvHealth/html/eh_water.htm		GIS
DOH		PWS Water Quality Monitoring	Washington	Monitor groundwater quality for public water systems	ftp://ftp3.doh.wa.gov/geodata/layers/marinewq03.zip		Access
DOH	Water Quality - Chimacum Cr nr Irondale	Biotoxin/Shellfish Program (Includes: Commercial Shellfish Licensing, Food Safety and Shellfish, Recreational Shellfish, Shellfish Growing Area Classification Programs)	WRIA	Recreational and commercial harvest areas; biotoxin bulletin at http://ww4.doh.wa.gov/gis/biotoxin.htm	http://www.doh.wa.gov/ehp/sl/BiotoxinProgram.htm		
Ecology		River and Stream Water Quality Monitoring Program	Washington	Status and trend monitoring of water quality	http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html	http://www.ecy.wa.gov/programs/eap/fw_riv/rv_methods.html	Download Tab Delimited
Ecology	Streamflow -Little Quilcene nr Mouth	Water Quality Program	Washington	Status and trend monitoring of water quality	http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html	http://www.ecy.wa.gov/programs/eap/fw_riv/rv_methods.html	Download Tab Delimited
Ecology	Streamflow -Big Quilcene R. nr Mouth	River and Streamflow Monitoring Program	Washington	Status and trend monitoring of water quality	http://www.ecy.wa.gov/programs/eap/flow/shu_main.html	http://www.ecy.wa.gov/programs/eap/fw_riv/rv_methods.html	Download Tab Delimited
Ecology		Long-term Marine Water Quality Monitoring Program	Washington	Monitor marine water quality in Puget Sound, Grays Harbor, and Willapa Bay	http://www.ecy.wa.gov/programs/eap/mar_wat/mwm_intr.html		Download Comma Delimited
Jefferson CD		Water Quality and Fish Monitoring Program	Jefferson County	Status and trend monitoring of water quality			
Jefferson CD	Surface Water Quality Database- No Station Locations	Surface Water Quality Database	Jefferson County	Status and trend monitoring of water quality			Access
Jefferson DSHS	Quilcene Bay Water Quality Monitoring- Not Mapped	Quilcene Bay Water Quality Monitoring	Jefferson County	Monitor water quality in Quilcene Bay			
Jefferson EHD	Drinking Water Program (well permitting data)	Drinking Water Program		Monitor drinking water quality in Jefferson County	http://www.co.jefferson.wa.us/envhealth/default.htm		
Jefferson PBD	Ludlow Watershed Water Quality Monitoring	Ludlow Watershed Water Quality Monitoring	Jefferson County	Characterize water quality in Ludlow watershed			
Pope Resources	Port Ludlow Non-Point Monitoring Program	Port Ludlow Non-Point Monitoring Program	Port Ludlow Area	Monitor non-point source pollutants to Port Ludlow Bay			
Port Ludlow Assoc.	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Area	Assess long-term condition of aquifers in the area			
Port Townsend	Port Townsend Drinking Water - Big Quilcene	Port Townsend Drinking Water Program	Port Townsend Area				hard copy - Excel
Port Townsend	Streamflow - Little Quilcene River at Diversion	Streamflow - Little Quilcene River at Diversion	Jefferson County	Monitor streamflow in local streams			
Port Townsend	Streamflow - Chimacum Creek	Streamflow - Chimacum Creek	Jefferson County	Monitor streamflow in local streams			
S'Klallam	Stream Temperature Monitoring Program	Stream Temperature Monitoring Program	WRIA	Monitor stream temperature for suitability of salmon habitat			
USDA	Pacific Northwest Regional Water Quality Program - No Sites in WRIA 17	Pacific Northwest Regional Water Quality Program	Pacific Northwest	Provide leadership for water resources research, education, and outreach to help communities, industry, and governments prevent and solve current and emerging water quality and quantity	http://www.pnwwaterweb.com		
USEPA	STORET Legacy Data Center - Water Quality Data Database (River Miles)	STORET Legacy Data Center - Water Quality Data Database		Compiles water quality data in rivers/streams, estuaries, groundwater, outfall	http://www.epa.gov/storpubl/legacy/gateway.htm		Download Comma Delimited
USEPA	STORET (River Miles)	STORET		Compiles water quality data in rivers/streams, estuaries, groundwater, outfall	http://oaspub.epa.gov/storpubl/warehousemenu		
USFW	Quilcene Water Quality Monitoring	Quilcene Water Quality Monitoring		Monitor water temperature in Big Quilcene and Penny Cr for Quilcene National Fish Hatchery			
USGS	National Streamflow Information Program	National Streamflow Information Program	US		http://water.usgs.gov/nsip		
USGS	Groundwater Quality Monitoring Program	Groundwater Quality Monitoring Program	Washington	Monitor water quality in groundwater	http://waterdata.usgs.gov/nwis		Download Comma Delimited

Publications

Organization	Program Name	Publication		Date	Source	Description
Jefferson CD	Surface Water Quality Monitoring Program	Quilcene/Dabob Water Quality Project Technical Report	Banks, Welch, and Purser	1987	Jefferson CD	Freshwater FC, flow, and temp. Marine FC, temp., and salinity.
Jefferson CD	Surface Water Quality Monitoring Program	Discovery Bay Watershed Water Quality Assessment (Draft)	Gately	1995	Jefferson CD	Freshwater water quality monitoring in the Discovery Bay watershed and fecal coliform monitoring in clams.
Jefferson CD	Surface Water Quality Monitoring Program	Jefferson County Ambient Water Quality Report	Rubida	1989	Jefferson CD	Freshwater & marine fecal coliform in Discovery Bay, Port Townsend Bay, Mats Mats Bay,Ludlow Bay, and Jackson
Jefferson CD	Surface Water Quality Monitoring Program	Water Quality in the Ludlow Watershed 1991 - 1992	Gately	1993	Jefferson CD	Freshwater water quality monitoring in the Ludlow Watershed.
Jefferson CD	Surface Water Quality Monitoring Program	Quilcene Watershed Water Quality Monitoring Progress Report November 1992 - April 1993	Gately	1993	Jefferson CD	Freshwater and marine fecal coliform monitoring in the Quilcene watershed in relationship to seal abundance.
Jefferson CD	Surface Water Quality Monitoring Program	Water Quality Screening Report	Gately	1997	Jefferson CD	WATER QUALITY MONITORING IN STREAMS IN JEFFERSON COUNTY.
Jefferson CD	Surface Water Quality Monitoring Program	Water Quality Screening Report	Gately	1999	Jefferson CD	WATER QUALITY MONITORING IN STREAMS IN JEFFERSON COUNTY.
Jefferson CD	Surface Water Quality Monitoring Program	Water Quality Screening Report	Gately	2001	Jefferson CD	WATER QUALITY MONITORING IN STREAMS IN JEFFERSON COUNTY.
Port Ludlow Associates, LLC	Port Ludlow Area Groundwater Monitoring Program	2002 Annual Report		2002	Robinson & Noble	Annual Report of groundwater well monitoring program
Port Ludlow Associates, LLC	Port Ludlow Non-Point Monitoring Program	2002 Report		2003	Aquatic Research, Inc	Annual report of non-point source surface water pollution
		Habitat Conditions and Water Quality for selected watersheds of Hood Canal and the Eastern Strait of Juan de Fuca	Bernthal, C.R., R. Rot, T. Ostrom	1999	PNPTC	Stream and riparian habitat conditons and water quality
USFW		Quilcene National Fish Hatchery water temperature records, January 1983 to 1988	U.S. Fish and Wildlife	1988	USFW	Water temperature in Big Quilcene and Penny Cr for Quilcene National Fish Hatchery
USFW		Quilcene water temperature records, July 1988 to July 1993	U.S. Fish and Wildlife	1993	USFW	Water temperature in Big Quilcene and Penny Cr for Quilcene National Fish Hatchery
DOH	Growing Area Water Quality Monitoring	Annual growing area review	DOH	1999	DOH	Water quality in shellfish-growing areas
Jefferson PBD	Ludlow Watershed Water Quality Monitoring	Ludlow watershed characterization and water quality assessment	Ludlow Watershed Management Committee	1991		Water quality in Ludlow watershed
Ecology	Water Quality Program	Washington State Water Quality Assessment Year 2002 Section 305(b) Report	Ecology	2002	Ecology	Water quality in Washington State 2002
Ecology	Long-term Marine Water Quality Monitoring Program	Washington State Marine Water Quality, 1998 to 2000		2002	Ecology	
US EPA / Ecology	Clean Water Act, Impaired or threatened waterbodies	303 (d) List	www.ecy.wa.gov/programs/wq/303d/1998/wrias/wria17.pdf	1998 and 2000	US EPA / Ecology	List of surface waters for which beneficial uses are impaired by pollutants
		Stage 1 Technical Assessment: Water Resources Inventory Area 17		2000	Parametrix	WMA, Phase 2, Stage 1 Technical Assessment

303(d) Waterbodies

Township	Range	Section	PARAMETER	BASIS	LIST?	MEDIUM	Action Needed	96list?
29N	02W	06	Fecal Coliform	Clallam County , 1991 show 5 excursions beyond the upper criterion at the mouth between 4/17/91 and 9/22/91.	Yes	Water	TMDL	Yes
29N	01W	14	Fecal Coliform	Two excursions beyond the upper criterion at Ecology ambient monitoring station 17B100 on 10/25/93 and 11/21/93.	Yes	Water	TMDL	Yes
30N	03W	27	Fecal Coliform	Clallam County, 1991. Geo. mean of samples collected near the mouth in 1991 exceed the lower criterion.	Yes	Water	TMDL	Yes
			Fecal Coliform	Department of Health Prohibited Commercial Shellfish Area in Quilcene Bay based partially on data from station 19 that exceed the criterion (from the Annual Growing Area Review ending December 1996).	Yes	Water	TMDL	Yes
27N	01W	19	Fish Habitat	The following references document habitat alterations: Mayte et al. 1994 , several habitat quality scores of 'poor' and 'fair' according to the TFW watershed analysis manual threshold. The following references document impairment of characteristic uses:	Yes	Habitat	Other Control	Yes
26N	02W	14	Fish Habitat	The following references document habitat alterations: Mayte et al. 1994 , several habitat quality scores of 'poor' and 'fair' according to the TFW watershed analysis manual threshold. The following references document impairment of characteristic uses	Yes	Habitat	Other Control	Yes
26N	02W	13	Fish Habitat	The following references document habitat alterations: Mayte et al. 1994 , several habitat quality scores of 'poor' and 'fair' according to the TFW watershed analysis manual threshold. The following references document impairment of characteristic uses	Yes	Habitat	Other Control	Yes
27N	02W	22	Instream Flow	Matye, et al. 1994. , documents flows collected at 5 USGS gauging stations near Big Quilcene RM 2.7, fish instream flow needs, and human-caused contributions. Hosey and Associates, 1985., documents fish instream flow needs. Morgan and Lutz, 1995., d	Yes	Habitat	Other Control	Yes
27N	01W	04	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 17 excursions beyond the criterion out of 23 samples (74%) at Donavon Creek RM 0.2 (WDF# 17.0115) between 1992 and 1994.	Yes	Water	TMDL	No
27N	02W	11	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 11 excursions beyond the criterion out of 21 samples (52%) at Leland Creek RM 0.2 (WDF# 17.0077) between 1992 and 1994.	Yes	Water	TMDL	No
28N	01W	09	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 15 excursions beyond the criterion out of 23 samples (65%) at Chimacum Creek RM 8.8 (WDF#17.0203) between 1992 and 1994.	Yes	Water	TMDL	Yes
28N	02W	35	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 8 excursions beyond the criterion out of 21 samples (38%) at Ripley Creek RM 0.2 (WDF# 17.0089) between 1992 and 1994.	Yes	Water	TMDL	No

303(d) Waterbodies

Township	Range	Section	PARAMETER	BASIS	LIST?	MEDIUM	Action Needed	96list?
28N	01W	33	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 3 excursions beyond the criterion out of 24 samples (13%) at East Fork Tarboo Creek RM 0.5 (WDF# 17.0130) between 1992 and 1994.	Yes	Water	TMDL	Yes
27N	01W	24	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 3 excursions beyond the criterion out of 22 samples (14%) at the mouth of the unnamed tributary at Thorndike Creek RM 1.1 (WDF# 17.0171) between 1992 and 1994.	Yes	Water	TMDL	No
28N	01W	20	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 15 excursions beyond the criterion out of 24 samples (63%) at Tarboo Creek RM 2.5 (WDF# 17.0129) between 1992 and 1994.	Yes	Water	TMDL	Yes
29N	01W	14	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 5 excursions beyond the criterion out of 23 samples (22%) at East Chimacum Creek RM 1.0 (WDF#17.0205) between 1992 and 1994.	Yes	Water	TMDL	Yes
29N	01W	14	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 15 excursions beyond the criterion out of 23 samples (65%) at Chimacum Creek RM 3.5 (WDF#17.0203) between 1992 and 1994.	Yes	Water	TMDL	Yes
27N	02W	11	Temperature	Port Gamble S'Klallam Tribal data (submitted by Peter Bahls on 10/13/97) show 5 excursions beyond the criterion out of 21 samples (23%) at Little Quilcene RM 2.0 between 1992 and 1994.	Yes	Water	TMDL	No
			pH	3 excursions beyond the criterion out of 10 samples (30%) at Ecology ambient monitoring station JDF005 between 9/91 and 9/96.	Yes	Water	TMDL	Yes
			Dissolved Oxygen	3 excursions beyond the criterion out of 10 samples (30%) at Ecology ambient monitoring station JDF005 between 9/91 and 9/96.	Yes	Water	TMDL	Yes

TABLE 7
LOCATIONS

Location Name	Category	Parent Jurisdiction	Parent Water Body/Sub-Watershed	GIS Reference	Comment
AND/0.0	River		Salmon-Snow		
AND/0.0	River		Salmon-Snow		
AND/0.8-1.5	River		Salmon-Snow		
AND/0.84	River		Salmon-Snow		
AND/1.0	River		Salmon-Snow		
AND/1.6	River		Salmon-Snow		
AND/1.6	River		Salmon-Snow		
AND/1.6-2.0	River		Salmon-Snow		
AND/1.6-2.00	River		Salmon-Snow		
AND/1.71	River		Salmon-Snow		
AND/2.0	River		Salmon-Snow		
AND/2.2	River		Salmon-Snow		
AND/2.2	River		Salmon-Snow		
AND/3.8	River		Salmon-Snow		
BH/0.0	River		Chimacum		
BH/0.0-0.1	River		Chimacum		
BH/0.66	River		Chimacum		
BH/0.70	River		Chimacum		
BH/0.8-1.0	River		Chimacum		
BH/1.0	River		Chimacum		
BH/1.0-1.1	River		Chimacum		
BH/1.1-1.2	River		Chimacum		
BI/0.2-0.3	River		Chimacum		
BQ/0.64	River		Big Quilcene		
BQ/2.8	River		Big Quilcene		
BQ/4.06	River		Big Quilcene		
CA/LP	River		Dabob-Thorndyke		
CD/0.2	Water		Quilcene		
CD/0.4	Water		Quilcene		
CH/0.0	River		Chimacum		
CH/0.07/G20	River		Chimacum		
CH/0.1	River		Chimacum		
CH/0.27/G21	River		Chimacum		
CH/0.27/G22	River		Chimacum		
CH/0.34/G23	River		Chimacum		
CH/0.34/G24	River		Chimacum		
CH/1.1	River		Chimacum		
CH/1.1	River		Chimacum		
CH/1.2	River		Chimacum		
CH/1.9-2.00	River		Chimacum		
CH/1.9DRB	River		Chimacum		
CH/11.6-11.75	River		Chimacum		
CH/11.75-11.8	River		Chimacum		
CH/11.8	River		Chimacum		
CH/11.8-11.96	River		Chimacum		
CH/11.96-12.23	River		Chimacum		
CH/12.39-12.58	River		Chimacum		
CH/12.5	River		Chimacum		
CH/12.7-12.8	River		Chimacum		
CH/12.8-13.05	River		Chimacum		
CH/12.9	River		Chimacum		
CH/2.0	River		Chimacum		
CH/2.3	River		Chimacum		
CH/2.35	River		Chimacum		
CH/2.8-2.9	River		Chimacum		
CH/2.94-3.06	River		Chimacum		
CH/3.0	River		Chimacum		
CH/3.0/G28	River		Chimacum		
CH/3.0/G29	River		Chimacum		
CH/3.0/G30	River		Chimacum		
CH/3.4	River		Chimacum		
CH/3.8	River		Chimacum		
CH/3.8-3.9	River		Chimacum		
CH/3.9	River		Chimacum		
CH/3.9	River		Chimacum		
CH/3.91	River		Chimacum		
CH/3.9-4.0	River		Chimacum		
CH/5.3	River		Chimacum		
CH/5.3	River		Chimacum		
CH/5.34	River		Chimacum		
CH/5.3-5.7	River		Chimacum		
CH/5.36	River		Chimacum		
CH/5.70-5.73	River		Chimacum		
CH/5.73	River		Chimacum		
CH/5.73-5.92	River		Chimacum		
CH/5.98-5.99	River		Chimacum		
CH/5.99-6.10	River		Chimacum		
CH/6.0	River		Chimacum		
CH/6.1	River		Chimacum		
CH/6.10-6.13	River		Chimacum		
CH/6.2	River		Chimacum		
CH/6.2-6.5	River		Chimacum		
CH/6.5	River		Chimacum		
CH/6.7	River		Chimacum		
CH/6.7	River		Chimacum		
CH/7.0	River		Chimacum		
CH/7.8	River		Chimacum		
CH/8.2	River		Chimacum		
CH/8.3	River		Chimacum		
CH/8.4	River		Chimacum		
CH/8.6	River		Chimacum		
CH/8.8	River		Chimacum		
CH/8.98-9.20	River		Chimacum		
CH/9.0	River		Chimacum		
CH/9.0W	River		Chimacum		
CH/9.20-9.38	River		Chimacum		
CH/9.3	River		Chimacum		
CH/9.3/G26	River		Chimacum		
CH/9.3/G27	River		Chimacum		
CH/9.38-9.40	River		Chimacum		
CH/9.4	River		Chimacum		
CH/9.4	River		Chimacum		
CH/9.40-9.44	River		Chimacum		
CJ/0.2-0.4	River		Quilcene		
D1	River		Chimacum		

TABLE 7
LOCATIONS

Location Name	Category	Parent Jurisdiction	Parent Water Body/Sub-Watershed	GIS Reference	Comment
D2	River		Chimacum		
D3	River		Chimacum		
D4	River		Chimacum		
D5	River		Chimacum		
D6	River		Chimacum		
D7	River		Chimacum		
DV/0.0-0.4	River		Little Quilcene		
DV/0.1	River		Little Quilcene		
DV/0.4	River		Little Quilcene		
DV/0.4-0.6	River		Little Quilcene		
DV/0.5	River		Little Quilcene		
DV/1.5	River		Little Quilcene		
DV/1.9	River		Little Quilcene		
ECH/0.1	River		Chimacum		
ECH/0.1	River		Chimacum		
ECH/0.2	River		Chimacum		
ECH/0.65-0.74	River		Chimacum		
ECH/0.7	River		Chimacum		
ECH/0.9-1.0	River		Chimacum		
ECH/1.0	River		Chimacum		
ECH/1.0	River		Chimacum		
ECH/1.0-1.2	River		Chimacum		
ECH/1.2	River		Chimacum		
ECH/1.24-1.33	River		Chimacum		
ECH/1.3	River		Chimacum		
ECH/1.3	River		Chimacum		
ECH/1.77-1.86	River		Chimacum		
ECH/1.8	River		Chimacum		
ECH/2.19-2.21	River		Chimacum		
ECH/2.2	River		Chimacum		
ECH/2.2	River		Chimacum		
ECH/2.78-2.80	River		Chimacum		
ECH/2.8	River		Chimacum		
ECH/3.3	River		Chimacum		
ECH/3.3	River		Chimacum		
ECH/4.3-4.4	River		Chimacum		
ECH/4.8	River		Chimacum		
ECH/5.1-5.3	River		Chimacum		
ECH/5.3	River		Chimacum		
ECH/5.3-5.6	River		Chimacum		
ECH/5.4	River		Chimacum		
EHO/0.0	River		Salmon-Snow		
EHO/0.2	River		Salmon-Snow		
H/CH/B	Fish Hatchery		Chimacum		
H/CH/BLT	Fish Hatchery		Chimacum		
H/CH/BRT	Fish Hatchery		Chimacum		
H/CH/EP	Fish Hatchery		Chimacum		
H/CH/HR	Fish Hatchery		Chimacum		
H/CH/P1	Fish Hatchery		Chimacum		
H/CH/P2	Fish Hatchery		Chimacum		
H/CH/PD	Fish Hatchery		Chimacum		
HO/0.0	River		Salmon-Snow		
HO/0.02	River		Salmon-Snow		
HO/0.1	River		Salmon-Snow		
IN/0.00-0.15	River		Quilcene		
IN/0.15-0.20	River		Quilcene		
IN/0.2	River		Quilcene		
JK/0.0	River		Little Quilcene		
JK/0.0-0.1	River		Little Quilcene		
JK/0.1	River		Little Quilcene		
JK/0.1	River		Little Quilcene		
JK/0.1-0.4	River		Little Quilcene		
JK/0.2	River		Little Quilcene		
JK/0.24	River		Little Quilcene		
JK/0.25	River		Little Quilcene		
JK/0.25P	River		Little Quilcene		
JK/0.26	River		Little Quilcene		
JK/0.3	River		Little Quilcene		
JK/0.4	River		Little Quilcene		
JK/0.4	River		Little Quilcene		
JKT/0.0	River		Little Quilcene		
JN/0.0	River		Ludlow		
JN/1.2	River		Ludlow		
L/HWY101	River		Little Quilcene		
L/LELCK	River		Little Quilcene		
L/MR/5684	River		Little Quilcene		
L/MR/6929	River		Little Quilcene		
L/SCR/2692	River		Little Quilcene		
L/SCR/2989	River		Little Quilcene		
L/SCR/3365	River		Little Quilcene		
L/SCR/4366	River		Little Quilcene		
L/WLVR/23	River		Little Quilcene		
LA/0.3	River		Discovery Bay		
LD/0.0	River		Ludlow		
LD/0.0-0.2	River		Ludlow		
LD/0.2-0.5	River		Ludlow		
LD/0.5-1.0	River		Ludlow		
LD/1.0	River		Ludlow		
LD/1.1-1.2	River		Ludlow		
LD/1.1P	Lake		Ludlow		
LD1	River		Ludlow		
LD11	River		Ludlow		
LD21	River		Ludlow		
LD31	River		Ludlow		
LD4	River		Ludlow		
LD41	River		Ludlow		
LD51	River		Ludlow		
LD6	River		Ludlow		
LD61	River		Ludlow		
LD7	River		Ludlow		
LD71	River		Ludlow		
LD8	River		Ludlow		
LL/0078/0.07-0.10	River		Little Quilcene		
LL/0078/0.10-0.13	River		Little Quilcene		
LL/2.9	River		Little Quilcene		

TABLE 7
LOCATIONS

Location Name	Category	Parent Jurisdiction	Parent Water Body/Sub-Watershed	GIS Reference	Comment
LL/3.5	River		Little Quilcene		
LL/3.95	River		Little Quilcene		
LL/4.0	River		Little Quilcene		
LL/4.1-5.3	Lake		Little Quilcene		
LQ/0.8	River		Little Quilcene		
NA/0.0-0.2	River		Chimacum		
NA/0.1	River		Chimacum		
NA/0.2	River		Chimacum		
NA/0.5-0.7	River		Chimacum		
NA/0.5P	River		Chimacum		
NA/0.7	River		Chimacum		
NA/0.7	River		Chimacum		
PU/0.0	River		Chimacum		
PU/0.0	River		Chimacum		
PU/0.0-0.1	River		Chimacum		
PU/0.0-0.38	River		Chimacum		
PU/0.1-0.38	River		Chimacum		
PU/0.38-0.40	River		Chimacum		
PU/0.4	River		Chimacum		
PU/0.40-0.50	River		Chimacum		
PU/0.40P	River		Chimacum		
PU/0.5	River		Chimacum		
RA/0.00-0.01	River		Quilcene		
RA/0.01-0.02	River		Quilcene		
RA/0.02-0.10	River		Quilcene		
Rock Lake	Lake		Chimacum		
SA/0.0	River		Salmon-Snow		
SA/0.1	River		Salmon-Snow		
SA/0.1	River		Salmon-Snow		
SA/0.7	River		Salmon-Snow		
SA/0.7	River		Salmon-Snow		
SA/1.0	River		Salmon-Snow		
SA/2.7	River		Salmon-Snow		
SN/0.1	River		Salmon-Snow		
SN/0.19	River		Salmon-Snow		
SN/0.2	River		Salmon-Snow		
SN/0.2	River		Salmon-Snow		
SN/1.6	River		Salmon-Snow		
SN/1.6	River		Salmon-Snow		
SN/3.5	River		Salmon-Snow		
SN/4.4	River		Salmon-Snow		
SN/4.4	River		Salmon-Snow		
SN/7.0	River		Salmon-Snow		
SW/0.39-0.52	River		Chimacum		
TB/0.9	River		Dabob-Thorndyke		
TB/0.9	River		Dabob-Thorndyke		
TB/2.4	River		Dabob-Thorndyke		
TB/2.6	River		Dabob-Thorndyke		
TB/2.90-3.05	River		Dabob-Thorndyke		
TB/3.05-3.20	River		Dabob-Thorndyke		
TB/3.8	River		Dabob-Thorndyke		
TB/4.0	River		Dabob-Thorndyke		
TB/4.0	River		Dabob-Thorndyke		
TB/4.2-4.3	River		Dabob-Thorndyke		
YA/0.0-0.2	River		Quilcene		
YA/0.2	River		Quilcene		
ZE/0.2	Water		Discovery Bay		
ZE/0.3	Water		Discovery Bay		
ZE2	Water		Discovery Bay		
17A060	River		Big Quilcene		
17A070	River		Big Quilcene		
17B070	River		Chimacum		
17B090	River		Chimacum		
17B100	River		Chimacum		
17B110	River		Chimacum		
17C070	River		West Sequim Bay		
17D060	River		Little Quilcene		
17E060	River		Salmon-Snow		
17F060	River		Salmon-Snow		
12050500	River		Salmon-Snow		
12051500	River		Chimacum		
12052210	River		Big Quilcene		
12052500	River		Big Quilcene		
12052000	River		Little Quilcene		
12052400	River		Big Quilcene		
Little Quilcene River at Diversi	River		Little Quilcene		
Chimacum Creek	River		Chimacum		
DIS001	Water		Discovery Bay		
PTH001	Water		Admiralty Inlet		
JDF007	Water		Strait of Juan de Fuca		
JDF005	Water		Strait of Juan de Fuca		
SEQ002	Water		Strait of Juan de Fuca		
ADM002	Water		Admiralty Inlet		
DB-96	Water		Hood Canal	marinewq03	
DB-97	Water		Hood Canal	marinewq03	
DB-102	Water		Hood Canal	marinewq03	
DB-105	Water		Hood Canal	marinewq03	
DB-106	Water		Hood Canal	marinewq03	
DB-107	Water		Hood Canal	marinewq03	
DB-113	Water		Hood Canal	marinewq03	
DB-98	Water		Hood Canal	marinewq03	
DB-99	Water		Hood Canal	marinewq03	
DB-100	Water		Hood Canal	marinewq03	
DB-109	Water		Hood Canal	marinewq03	
DB-110	Water		Hood Canal	marinewq03	
DB-111	Water		Hood Canal	marinewq03	
DB-112	Water		Hood Canal	marinewq03	
DB-294	Water		Hood Canal	marinewq03	
DB-295	Water		Hood Canal	marinewq03	
DB-296	Water		Hood Canal	marinewq03	
DB-297	Water		Hood Canal	marinewq03	
DSB-51	Water		Strait of Juan de Fuca	marinewq03	
DSB-52	Water		Strait of Juan de Fuca	marinewq03	
DSB-54	Water		Strait of Juan de Fuca	marinewq03	
DSB-58	Water		Strait of Juan de Fuca	marinewq03	

TABLE 7
LOCATIONS

Location Name	Category	Parent Jurisdiction	Parent Water Body/Sub-Watershed	GIS Reference	Comment
DSB-59	Water		Strait of Juan de Fuca	marinewq03	
DSB-60	Water		Strait of Juan de Fuca	marinewq03	
DSB-61	Water		Strait of Juan de Fuca	marinewq03	
DSB-66	Water		Strait of Juan de Fuca	marinewq03	
DSB-67	Water		Strait of Juan de Fuca	marinewq03	
DSB-47	Water		Strait of Juan de Fuca	marinewq03	
DSB-48	Water		Strait of Juan de Fuca	marinewq03	
DSB-49	Water		Strait of Juan de Fuca	marinewq03	
DSB-50	Water		Strait of Juan de Fuca	marinewq03	
DSB-56	Water		Strait of Juan de Fuca	marinewq03	
DSB-57	Water		Strait of Juan de Fuca	marinewq03	
DSB-62	Water		Strait of Juan de Fuca	marinewq03	
DSB-171	Water		Strait of Juan de Fuca	marinewq03	
MMB-5	Water		Hood Canal	marinewq03	
MMB-7	Water		Hood Canal	marinewq03	
MMB-12	Water		Hood Canal	marinewq03	
MMB-14	Water		Hood Canal	marinewq03	
MMB-1	Water		Hood Canal	marinewq03	
MMB-2	Water		Hood Canal	marinewq03	
MMB-8	Water		Hood Canal	marinewq03	
MMB-9	Water		Hood Canal	marinewq03	
MMB-10	Water		Hood Canal	marinewq03	
OB-1	Water		Strait of Juan de Fuca	marinewq03	
OB-2	Water		Strait of Juan de Fuca	marinewq03	
OB-3	Water		Strait of Juan de Fuca	marinewq03	
OB-4	Water		Strait of Juan de Fuca	marinewq03	
OB-5	Water		Strait of Juan de Fuca	marinewq03	
OB-6	Water		Strait of Juan de Fuca	marinewq03	
OB-7	Water		Strait of Juan de Fuca	marinewq03	
OB-8	Water		Strait of Juan de Fuca	marinewq03	
OB-173	Water		Strait of Juan de Fuca	marinewq03	
PT-33	Water		Strait of Juan de Fuca	marinewq03	
PT-34	Water		Strait of Juan de Fuca	marinewq03	
PT-35	Water		Strait of Juan de Fuca	marinewq03	
PT-38	Water		Strait of Juan de Fuca	marinewq03	
PT-32	Water		Strait of Juan de Fuca	marinewq03	
PT-43	Water		Strait of Juan de Fuca	marinewq03	
PT-44	Water		Strait of Juan de Fuca	marinewq03	
PT-45	Water		Strait of Juan de Fuca	marinewq03	
PT-40	Water		Strait of Juan de Fuca	marinewq03	
PT-39	Water		Strait of Juan de Fuca	marinewq03	
PT-41	Water		Strait of Juan de Fuca	marinewq03	
PT-42	Water		Strait of Juan de Fuca	marinewq03	
KH-12	Water		Strait of Juan de Fuca	marinewq03	
KH-14	Water		Strait of Juan de Fuca	marinewq03	
KH-15	Water		Strait of Juan de Fuca	marinewq03	
KH-22	Water		Strait of Juan de Fuca	marinewq03	
KH-23	Water		Strait of Juan de Fuca	marinewq03	
KH-25	Water		Strait of Juan de Fuca	marinewq03	
KH-10	Water		Strait of Juan de Fuca	marinewq03	
KH-11	Water		Strait of Juan de Fuca	marinewq03	
KH-13	Water		Strait of Juan de Fuca	marinewq03	
KH-16	Water		Strait of Juan de Fuca	marinewq03	
KH-18	Water		Strait of Juan de Fuca	marinewq03	
KH-19	Water		Strait of Juan de Fuca	marinewq03	
KH-20	Water		Strait of Juan de Fuca	marinewq03	
KH-21	Water		Strait of Juan de Fuca	marinewq03	
KH-24	Water		Strait of Juan de Fuca	marinewq03	
QB-114	Water		Hood Canal	marinewq03	
QB-115	Water		Hood Canal	marinewq03	
QB-116	Water		Hood Canal	marinewq03	
QB-117	Water		Hood Canal	marinewq03	
QB-118	Water		Hood Canal	marinewq03	
QB-119	Water		Hood Canal	marinewq03	
QB-123	Water		Hood Canal	marinewq03	
QB-120	Water		Hood Canal	marinewq03	
SB-72	Water		Strait of Juan de Fuca	marinewq03	
SB-73	Water		Strait of Juan de Fuca	marinewq03	
SB-74	Water		Strait of Juan de Fuca	marinewq03	
SB-79	Water		Strait of Juan de Fuca	marinewq03	
SB-81	Water		Strait of Juan de Fuca	marinewq03	
SB-82	Water		Strait of Juan de Fuca	marinewq03	
SB-88	Water		Strait of Juan de Fuca	marinewq03	
SB-89	Water		Strait of Juan de Fuca	marinewq03	
SB-90	Water		Strait of Juan de Fuca	marinewq03	
SB-96	Water		Strait of Juan de Fuca	marinewq03	
SB-97	Water		Strait of Juan de Fuca	marinewq03	
SB-98	Water		Strait of Juan de Fuca	marinewq03	
SB-78	Water		Strait of Juan de Fuca	marinewq03	
SB-76	Water		Strait of Juan de Fuca	marinewq03	
SB-87	Water		Strait of Juan de Fuca	marinewq03	
SB-75	Water		Strait of Juan de Fuca	marinewq03	
SB-77	Water		Strait of Juan de Fuca	marinewq03	
SB-83	Water		Strait of Juan de Fuca	marinewq03	
SB-84	Water		Strait of Juan de Fuca	marinewq03	
SB-86	Water		Strait of Juan de Fuca	marinewq03	
SB-91	Water		Strait of Juan de Fuca	marinewq03	
SB-93	Water		Strait of Juan de Fuca	marinewq03	
Marple	River			pgst str temp mon sites	
Spencer	River			pgst str temp mon sites	
Big Quilcene, Lower	River			pgst str temp mon sites	
Big Quilcene, Middle	River			pgst str temp mon sites	
Big Quilcene, Upper	River			pgst str temp mon sites	
Penny	River			pgst str temp mon sites	
Little Quilcene, Lower	River			pgst str temp mon sites	
Little Quilcene, Upper	River			pgst str temp mon sites	
Leland	River			pgst str temp mon sites	
Ripley	River			pgst str temp mon sites	
Howe	River			pgst str temp mon sites	
Donavan	River			pgst str temp mon sites	
EF Tarboo	River			pgst str temp mon sites	
Thorndyke	River			pgst str temp mon sites	
Nordstrom	River			pgst str temp mon sites	
Shine	River			pgst str temp mon sites	
Ludlow	River			pgst str temp mon sites	

TABLE 7
LOCATIONS

Location Name	Category	Parent Jurisdiction	Parent Water Body/Sub-Watershed	GIS Reference	Comment
30N/01W-07SWNE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-07SWSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-08	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-08NESE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-08NWSE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-08SENW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-09	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-09SSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-16NESW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-16SWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-16SWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-17SESW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-17SESW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-17SWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-17SWSE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-17SWSE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-17SWSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-18SWSE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-20NWSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-20SWNE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-20SWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-28SENW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-29NENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-29NESW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-29SENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-32SENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-32SESE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-32SWNE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-33NESE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-34SWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/01W-35SWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-12NENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-12NESE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-12NESE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-12SENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-12SWNE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-13NENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-13SENE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
30N/02W-34SE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
31N/01W-31	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
31N/01W-31	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
31N/01W-32NWSE	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
31N/01W-32NWSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
31N/01W-32NWSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
31N/01W-32SWSW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
N/0-0NWNW	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Bridgehaven Water System	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
City of Port Townsend Kivley W	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
City of Port Townsend Sparling	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Hendrickson Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Hill Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Hodges Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Hood Canal Seafood Oyster Co	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff Co Water District Paradise	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff PUD Bywater Bay Well 1 (S	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff PUD Bywater Bay Well 2 (I	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff PUD Gardiner Well 1	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff PUD Glen Cove South Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff PUD Glen Cove South Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Jeff PUD Glen Cove South Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Kala Point Water System	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Neault Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 12	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 13	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 14	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 2	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 3	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 4A	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 4N	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Pope Ludlow Well 9	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Quilcene Admin Site	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Quilcene National Fish Hatchery	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Shine Plat Well 2	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
Woodruff Well	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
25N/01W-04K01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
26N/01W-07K01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
26N/01W-18M01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
26N/01W-29R01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
26N/02W-13G01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01E-04E01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01E-05A01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01E-16E01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01W-18D02	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01W-18K01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01W-18P01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01W-18Q01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01W-19K01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/01W-36B01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/02W-22Q02	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/02W-22R01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/02W-24C01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/02W-24C02	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/02W-24H01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
27N/02W-27B01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-15J01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-16M01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-16P01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-16Q01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-16Q02	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-22B01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-22G01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-33M02	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-33N01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	
28N/01E-33P01	Groundwater			chloride in_wria_june05;nitrate in_wria_june05	

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Clallam	Drinking Water Program	29N/03W-01J01	29N/03W-01J01	Yes				1111223	386128				Nitrate
Clallam	Drinking Water Program	29N/03W-02G71	29N/03W-02G71	Yes				1102708	385128				Nitrate
Clallam	Drinking Water Program	29N/03W-12F71	29N/03W-12F71	Yes				1109682	379505				Nitrate
Clallam	Drinking Water Program	30N/03W-25F01	30N/03W-25F01	Yes				1110338	395372				Nitrate
Clallam	Drinking Water Program	30N/03W-27B04	30N/03W-27B04	Yes				1098020	398495				Nitrate
Clallam	Drinking Water Program	30N/03W-27C71	30N/03W-27C71	Yes				1099340	398495				Nitrate
Clallam	Drinking Water Program	30N/03W-27G71	30N/03W-27G71	Yes				1098020	395855				Nitrate
Clallam	Drinking Water Program	30N/03W-36L02	30N/03W-36L02	Yes				1110242	391421				Nitrate
DOH	Food Safety and Shellfish Programs	DB-96	Dabob Bay 96	Yes	1994-1998	47.78746	-122.82405	1151099.02	293570.0776				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-97	Dabob Bay 97	Yes	1994-1998	47.81836	-122.82311	1151621.418	304831.6895				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-102	Dabob Bay 102	Yes	1994-1998	47.80875	-122.79326	1158863.306	301139.223				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-105	Dabob Bay 105	Yes	1994-1998	47.78101	-122.83456	1148455.07	291285.1207				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-106	Dabob Bay 106	Yes	1994-1998	47.8108	-122.81753	1152920.766	302039.5596				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-107	Dabob Bay 107	Yes	1994-1998	47.78711	-122.79028	1159394.627	293229.5492				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-113	Dabob Bay 113	Yes	1994-1998	47.69556	-122.82936	1148924.75	260093.0535				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-98	Dabob Bay 98	Yes	1994-1998	47.82725	-122.82072	1152292.134	308058.2366				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-99	Dabob Bay 99	Yes	1994-1998	47.84219	-122.81333	1154246.998	313459.3063				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-100	Dabob Bay 100	Yes	1994-1998	47.83838	-122.80927	1155207.994	312044.3684				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-109	Dabob Bay 109	Yes	1994-1998	47.74664	-122.81059	1154024.231	278599.8766				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-110	Dabob Bay 110	Yes	1994-1998	47.73746	-122.8082	1154526.104	275237.3199				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-111	Dabob Bay 111	Yes	1994-1998	47.7231	-122.81356	1153072.867	270034.8887				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-112	Dabob Bay 112	Yes	1994-1998	47.71275	-122.82146	1151031.546	266310.9415				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-294	Dabob Bay 294	Yes	1994-1998	47.84527	-122.80637	1155984.387	314538.5366				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-295	Dabob Bay 295	Yes	1994-1998	47.8482	-122.81014	1155086.407	315630.7148				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-296	Dabob Bay 296	Yes	1994-1998	47.85181	-122.80478	1156435.795	316913.3461				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DB-297	Dabob Bay 297	Yes	1994-1998	47.85269	-122.80869	1155484.357	317258.8526				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-51	Discovery Bay 51	Yes	1994-1998	48.04735	-122.82999	1152098.651	388376.881				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-52	Discovery Bay 52	Yes	1994-1998	48.0537	-122.85129	1146951.276	390828.3105				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-54	Discovery Bay 54	Yes	1994-1998	48.07695	-122.88516	1138896.847	399525.4404				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-58	Discovery Bay 58	Yes	1994-1998	48.06587	-122.92626	1128743.483	395755.6939				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-59	Discovery Bay 59	Yes	1994-1998	48.05742	-122.91489	1131439.147	392599.0386				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-60	Discovery Bay 60	Yes	1994-1998	48.04579	-122.87266	1141650.28	388081.6746				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-61	Discovery Bay 61	Yes	1994-1998	48.02655	-122.86299	1143829.681	381003.2525				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-66	Discovery Bay 66	Yes	1994-1998	47.99613	-122.8523	1146153.469	369841.7494				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-67	Discovery Bay 67	Yes	1994-1998	48.03593	-122.82825	1152416.128	384201.4702				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-47	Discovery Bay 47	Yes	1994-1998	48.00795	-122.86132	1144059.402	374209.9747				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-48	Discovery Bay 48	Yes	1994-1998	48.00028	-122.87215	1141335.223	371483.1563				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-49	Discovery Bay 49	Yes	1994-1998	47.99467	-122.86749	1142421.592	369407.2884				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-50	Discovery Bay 50	Yes	1994-1998	48.01063	-122.83414	1150735.712	375013.115				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-56	Discovery Bay 56	Yes	1994-1998	48.10171	-122.88421	1139369.669	408548.0361				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-57	Discovery Bay 57	Yes	1994-1998	48.09136	-122.91672	1131326.92	404987.2678				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	DSB-62	Discovery Bay 62	Yes	1994-1998	48.0018	-122.84082	1149017.195	371835.8068				Fecal Coliform, Salinity, Temperature

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
DOH	Food Safety and Shellfish Programs	DSB-171	Discovery Bay 171	Yes	1994-1998	48.05337	-122.89827	1135462.416	391012.73				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-5	Mats Mats Bay 5	Yes	1994-1998	47.95647	-122.68638	1186415.82	354357.0859				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-7	Mats Mats Bay 7	Yes	1994-1998	47.95564	-122.6898	1185570.772	354074.6058				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-12	Mats Mats Bay 12	Yes	1994-1998	47.9615	-122.68551	1186673.087	356186.2396				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-14	Mats Mats Bay 14	Yes	1994-1998	47.95726	-122.685	1186760.791	354637.0362				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-1	Mats Mats Bay 1	Yes	1994-1998	47.9511	-122.68645	1186351.509	352399.2283				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-2	Mats Mats Bay 2	Yes	1994-1998	47.95091	-122.68951	1185600.198	352348.011				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-8	Mats Mats Bay 8	Yes	1994-1998	47.95638	-122.69278	1184847.317	354362.0873				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-9	Mats Mats Bay 9	Yes	1994-1998	47.95828	-122.69205	1185042.872	355050.6362				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	MMB-10	Mats Mats Bay 10	Yes	1994-1998	47.95765	-122.68929	1185713.381	354804.5755				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-1	Oak Bay 1	Yes	1994-1998	48.02247	-122.72682	1177102.203	378666.1982				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-2	Oak Bay 2	Yes	1994-1998	48.01461	-122.7274	1176889.753	375803.4072				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-3	Oak Bay 3	Yes	1994-1998	48.00821	-122.72188	1178183.082	373436.3363				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-4	Oak Bay 4	Yes	1994-1998	48.01315	-122.69833	1183989.622	375097.237				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-5	Oak Bay 5	Yes	1994-1998	48.01896	-122.71308	1180432.281	377303.7894				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-6	Oak Bay 6	Yes	1994-1998	48.02325	-122.72195	1178300.579	378921.3573				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-7	Oak Bay 7	Yes	1994-1998	47.99117	-122.71744	1179117.418	367195.7685				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-8	Oak Bay 8	Yes	1994-1998	47.97408	-122.70109	1182968.429	360866.0056				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	OB-173	Oak Bay 173	Yes	1994-1998	47.97252	-122.68467	1186975.524	360199.9454				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-33	Port Townsend 33	Yes	1994-1998	48.03018	-122.74927	1171680.087	381613.7255				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-34	Port Townsend 34	Yes	1994-1998	48.03311	-122.73418	1175397.519	382590.6497				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-35	Port Townsend 35	Yes	1994-1998	48.0355	-122.73404	1175453.292	383461.3583				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-38	Port Townsend 38	Yes	1994-1998	48.03174	-122.74111	1173690.138	382133.0086				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-32	Port Townsend 32	Yes	1994-1998	48.04927	-122.76815	1167237.095	388690.7136				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-43	Port Townsend 43	Yes	1994-1998	48.14307	-122.79767	1160892.519	423079.0167				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-44	Port Townsend 44	Yes	1994-1998	48.1358	-122.75977	1170076.148	420193.9815				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-45	Port Townsend 45	Yes	1994-1998	48.12637	-122.74577	1173408.073	416669.8746				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-40	Port Townsend 40	Yes	1994-1998	48.03394	-122.75131	1171215.281	382997.298				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-39	Port Townsend 39	Yes	1994-1998	48.02993	-122.74548	1172604.859	381499.4973				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-41	Port Townsend 41	Yes	1994-1998	48.07305	-122.74869	1172211.128	397243.4427				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	PT-42	Port Townsend 42	Yes	1994-1998	48.14024	-122.83368	1152077.067	422273.4621				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-12	Kilisut Harbor 12	Yes	1994-1998	48.03689	-122.70199	1183304.33	383776.2408				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-14	Kilisut Harbor 14	Yes	1994-1998	48.03035	-122.69127	1185868.564	381327.7926				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-15	Kilisut Harbor 15	Yes	1994-1998	48.03143	-122.70111	1183471.22	381779.9114				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-22	Kilisut Harbor 22	Yes	1994-1998	48.06336	-122.71795	1179637.397	393524.2589				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-23	Kilisut Harbor 23	Yes	1994-1998	48.07166	-122.71569	1180263.895	396537.506				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-25	Kilisut Harbor 25	Yes	1994-1998	48.04822	-122.70345	1183047.679	387916.6409				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-10	Kilisut Harbor 10	Yes	1994-1998	48.04549	-122.71015	1181385.119	386960.9808				Fecal Coliform, Salinity, Temperature

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
DOH	Food Safety and Shellfish Programs	KH-11	Kilisut Harbor 11	Yes	1994-1998	48.03709	-122.71052	1181219.907	383899.9575				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-13	Kilisut Harbor 13	Yes	1994-1998	48.03523	-122.69674	1184573.678	383139.7454				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-16	Kilisut Harbor 16	Yes	1994-1998	48.02459	-122.69747	1184301.127	379263.969				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-18	Kilisut Harbor 18	Yes	1994-1998	48.02737	-122.70308	1182953.382	380311.0526				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-19	Kilisut Harbor 19	Yes	1994-1998	48.03094	-122.70556	1182378.408	381627.6771				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-20	Kilisut Harbor 20	Yes	1994-1998	48.05955	-122.70119	1183700.595	392034.9519				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-21	Kilisut Harbor 21	Yes	1994-1998	48.05403	-122.71628	1179962.358	390111.8874				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	KH-24	Kilisut Harbor 24	Yes	1994-1998	48.08104	-122.72539	1177977.268	400016.2654				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-114	Quilcene Bay 114	Yes	1994-1998	47.80142	-122.86667	1140759.977	298934.3621				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-115	Quilcene Bay 115	Yes	1994-1998	47.80762	-122.86616	1140945.004	301191.8288				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-116	Quilcene Bay 116	Yes	1994-1998	47.81231	-122.85515	1143694.51	302830.7401				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-117	Quilcene Bay 117	Yes	1994-1998	47.80045	-122.84703	1145575.797	298453.7565				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-118	Quilcene Bay 118	Yes	1994-1998	47.78433	-122.85333	1143873.68	292616.2877				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-119	Quilcene Bay 119	Yes	1994-1998	47.76544	-122.85884	1142338.221	285763.8074				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-123	Quilcene Bay 123	Yes	1994-1998	47.76153	-122.85253	1143852.096	284297.2806				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	QB-120	Quilcene Bay 120	Yes	1994-1998	47.81842	-122.85732	1143220.115	305072.7226				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-72	Sequim Bay 72	Yes	1994-1998	48.08496	-123.03118	1103298.578	403431.5974				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-74	Sequim Bay 74	Yes	1994-1998	48.07915	-123.04459	1099961.402	401406.9742				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-79	Sequim Bay 79	Yes	1994-1998	48.0355	-123.01799	1106009.021	385305.0702				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-81	Sequim Bay 81	Yes	1994-1998	48.03667	-123.0005	1110298.282	385610.7226				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-82	Sequim Bay 82	Yes	1994-1998	48.04404	-123.00421	1109466.834	388323.6508				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-88	Sequim Bay 88	Yes	1994-1998	48.05996	-123.04299	1100151.384	394398.4908				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-96	Sequim Bay 96	Yes	1994-1998	48.07334	-123.01281	1107666.674	399066.8646				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-97	Sequim Bay 97	Yes	1994-1998	48.08086	-123.03133	1103219.22	401937.6514				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-98	Sequim Bay 98	Yes	1994-1998	48.0418	-123.02615	1104078.947	387659.0139				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-78	Sequim Bay 78	Yes	1994-1998	48.04068	-123.02448	1104475.668	387238.9929				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-76	Sequim Bay 76	Yes	1994-1998	48.06421	-123.04022	1100872.921	395928.734				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-75	Sequim Bay 75	Yes	1994-1998	48.07305	-123.04131	1100699.016	399159.7092				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-77	Sequim Bay 77	Yes	1994-1998	48.05171	-123.03453	1102133.238	391331.011				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-83	Sequim Bay 83	Yes	1994-1998	48.05371	-123.0115	1107784.158	391900.0338				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-84	Sequim Bay 84	Yes	1994-1998	48.06319	-123.0056	1109324.116	395315.9887				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-86	Sequim Bay 86	Yes	1994-1998	48.08247	-123.02353	1105141.762	402470.3597				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-91	Sequim Bay 91	Yes	1994-1998	48.02974	-123.0158	1106485.013	383189.5915				Fecal Coliform, Salinity, Temperature
DOH	Food Safety and Shellfish Programs	SB-93	Sequim Bay 93	Yes	1994-1998	48.03057	-122.99955	1110467.977	383379.9132				Fecal Coliform, Salinity, Temperature
Ecology	GroundWater Quality Program	26N/01W-07L	26N/01W-07L	Yes				1143514	283072				Chloride
Ecology	GroundWater Quality Program	26N/01W-29R		Yes				1150575	265353				Chloride
Ecology	GroundWater Quality Program	26N/02W-13H	26N/02W-13H	Yes				1140738	278888				Chloride
Ecology	GroundWater Quality Program	27N/01E-03A	27N/01E-03A	Yes				1194162	320831				Chloride
Ecology	GroundWater Quality Program	27N/02W-25K	27N/02W-25K	Yes				1138860	298297				Chloride
Ecology	GroundWater Quality Program	28N/01E-04B	28N/01E-04B	Yes				1187488	352511				Chloride
Ecology	GroundWater Quality Program	28N/01E-04B	28N/01E-04B	Yes				1187568	353015				Chloride
Ecology	GroundWater Quality Program	28N/01E-21R	28N/01E-21R	Yes				1189130	332910				Chloride

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Ecology	GroundWater Quality Program	28N/01E-27G	28N/01E-27G	Yes				1192481	330499				Chloride
Ecology	GroundWater Quality Program	28N/01E-33P	28N/01E-33P	Yes				1186084	322442				Chloride
Ecology	GroundWater Quality Program	28N/01E-34L	28N/01E-34L	Yes				1191301	323838				Chloride
Ecology	GroundWater Quality Program	28N/01E-35A	28N/01E-35A	Yes				1199066	326391				Chloride
Ecology	GroundWater Quality Program	28N/01E-35B	28N/01E-35B	Yes				1198253	326613				Chloride
Ecology	GroundWater Quality Program	28N/01E-35D	28N/01E-35D	Yes				1194710	326696				Chloride
Ecology	GroundWater Quality Program	29N/01E-04C	29N/01E-04C	Yes				1187798	385241				Nitrate, Chloride
Ecology	GroundWater Quality Program	29N/01E-04E	29N/01E-04E	Yes				1186196	383658				Chloride
Ecology	GroundWater Quality Program	29N/01E-04E	29N/01E-04E	Yes				1187004	383335				Chloride
Ecology	GroundWater Quality Program	29N/01E-04F	29N/01E-04F	Yes				1188421	382895				Chloride
Ecology	GroundWater Quality Program	29N/01E-04G	29N/01E-04G	Yes				1188972	383186				Chloride
Ecology	GroundWater Quality Program	29N/01E-04J	29N/01E-04J	Yes				1191107	381513				Chloride
Ecology	GroundWater Quality Program	29N/01E-04L	29N/01E-04L	Yes				1187302	381604				Chloride
Ecology	GroundWater Quality Program	29N/01E-04Q	29N/01E-04Q	Yes				1188511	380967				Chloride
Ecology	GroundWater Quality Program	29N/01E-07M	29N/01E-07M	Yes				1175377	377739				Chloride
Ecology	GroundWater Quality Program	29N/01E-08A	29N/01E-08A	Yes				1185154	379933				Chloride
Ecology	GroundWater Quality Program	29N/01E-08R	29N/01E-08R	Yes				1185241	375066				Nitrate, Chloride
Ecology	GroundWater Quality Program	29N/01E-09A	29N/01E-09A	Yes				1190785	379392				Chloride
Ecology	GroundWater Quality Program	29N/01E-09B	29N/01E-09B	Yes				1188603	379140				Nitrate, Chloride
Ecology	GroundWater Quality Program	29N/01E-09C	29N/01E-09C	Yes				1187605	380077				Chloride
Ecology	GroundWater Quality Program	29N/01E-09D	29N/01E-09D	Yes				1186783	379792				Chloride
Ecology	GroundWater Quality Program	29N/01E-09G	29N/01E-09G	Yes				1188433	377725				Chloride
Ecology	GroundWater Quality Program	29N/01E-09L	29N/01E-09L	Yes				1187447	376330				Chloride
Ecology	GroundWater Quality Program	29N/01E-09P	29N/01E-09P	Yes				1186959	375835				Chloride
Ecology	GroundWater Quality Program	29N/01E-09P	29N/01E-09P	Yes				1187821	374902				Chloride
Ecology	GroundWater Quality Program	29N/01E-09P	29N/01E-09P	Yes				1188113	375706				Chloride
Ecology	GroundWater Quality Program	29N/01E-09R	29N/01E-09R	Yes				1189953	375865				Chloride
Ecology	GroundWater Quality Program	29N/01E-09R	29N/01E-09R	Yes				1190091	375963				Chloride
Ecology	GroundWater Quality Program	29N/01E-19K	29N/01E-19K	Yes				1178169	366825				Chloride
Ecology	GroundWater Quality Program	29N/01E-29L	29N/01E-29L	Yes				1181582	361674				Chloride
Ecology	GroundWater Quality Program	29N/01E-29L	29N/01E-29L	Yes				1182376	360742				Chloride
Ecology	GroundWater Quality Program	29N/01E-33N	29N/01E-33N	Yes				1185913	354981				Chloride
Ecology	GroundWater Quality Program	29N/02W-23J	29N/02W-23J	Yes				1136820	367682				Chloride
Ecology	GroundWater Quality Program	29N/03W-01J01	29N/03W-01J01	Yes				1110690	384618				Chloride
Ecology	GroundWater Quality Program	29N/03W-02G	29N/03W-02G	Yes				1104486	386416				Chloride
Ecology	GroundWater Quality Program	29N/03W-12A	29N/03W-12A	Yes				1111284	381560				Chloride
Ecology	GroundWater Quality Program	29N/03W-12F	29N/03W-12F	Yes				1107719	380546				Chloride
Ecology	GroundWater Quality Program	29N/03W-12K	29N/03W-12K	Yes				1109333	379892				Chloride
Ecology	GroundWater Quality Program	30N/01E-18R	30N/01E-18R	Yes				1180931	401930				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/01E-20M	30N/01E-20M	Yes				1181934	398459				Chloride
Ecology	GroundWater Quality Program	30N/01E-20P	30N/01E-20P	Yes				1183451	396597				Chloride
Ecology	GroundWater Quality Program	30N/01E-20Q	30N/01E-20Q	Yes				1184540	396672				Chloride
Ecology	GroundWater Quality Program	30N/01E-20Q	30N/01E-20Q	Yes				1184971	397676				Chloride
Ecology	GroundWater Quality Program	30N/01E-21E	30N/01E-21E	Yes				1186293	398961				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/01E-21M	30N/01E-21M	Yes				1186548	398246				Chloride
Ecology	GroundWater Quality Program	30N/01E-28D	30N/01E-28D	Yes				1186753	395504				Chloride
Ecology	GroundWater Quality Program	30N/01E-28E	30N/01E-28E	Yes				1186254	394502				Chloride
Ecology	GroundWater Quality Program	30N/01E-28L	30N/01E-28L	Yes				1187328	393970				Chloride
Ecology	GroundWater Quality Program	30N/01E-28L	30N/01E-28L	Yes				1187495	392445				Chloride
Ecology	GroundWater Quality Program	30N/01E-29A	30N/01E-29A	Yes				1185861	395120				Chloride
Ecology	GroundWater Quality Program	30N/01E-29C	30N/01E-29C	Yes				1183555	395277				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/01E-29C	30N/01E-29C	Yes				1183577	396189				Chloride
Ecology	GroundWater Quality Program	30N/01E-29J	30N/01E-29J	Yes				1185957	393496				Chloride
Ecology	GroundWater Quality Program	30N/01E-29K	30N/01E-29K	Yes				1184648	392717				Chloride
Ecology	GroundWater Quality Program	30N/01E-29K	30N/01E-29K	Yes				1184653	392919				Chloride
Ecology	GroundWater Quality Program	30N/01E-29R	30N/01E-29R	Yes				1184907	392204				Chloride
Ecology	GroundWater Quality Program	30N/01E-29R	30N/01E-29R	Yes				1185508	391784				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/01E-29R	30N/01E-29R	Yes				1186037	391163				Chloride
Ecology	GroundWater Quality Program	30N/01E-32G	30N/01E-32G	Yes				1183960	389591				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/01E-32H	30N/01E-32H	Yes				1185372	388949				Chloride
Ecology	GroundWater Quality Program	30N/01E-32H	30N/01E-32H	Yes				1185634	388537				Chloride
Ecology	GroundWater Quality Program	30N/01E-32K	30N/01E-32K	Yes				1183509	387778				Chloride
Ecology	GroundWater Quality Program	30N/01E-32Q	30N/01E-32Q	Yes				1183867	385742				Chloride
Ecology	GroundWater Quality Program	30N/01E-33C	30N/01E-33C	Yes				1187650	390414				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/01E-33D	30N/01E-33D	Yes				1187388	390826				Chloride
Ecology	GroundWater Quality Program	30N/01E-33F	30N/01E-33F	Yes				1187478	388898				Chloride
Ecology	GroundWater Quality Program	30N/01E-33M	30N/01E-33M	Yes				1187123	388298				Chloride
Ecology	GroundWater Quality Program	30N/01W-16K	30N/01W-16K	Yes				1157907	404534				Chloride
Ecology	GroundWater Quality Program	30N/01W-16K	30N/01W-16K	Yes				1158183	404729				Chloride
Ecology	GroundWater Quality Program	30N/01W-16K	30N/01W-16K	Yes				1158309	404321				Chloride
Ecology	GroundWater Quality Program	30N/01W-29E	30N/01W-29E	Yes				1150316	394695				Chloride
Ecology	GroundWater Quality Program	30N/01W-33M	30N/01W-33M	Yes				1154894	387784				Chloride
Ecology	GroundWater Quality Program	30N/02W-12K	30N/02W-12K	Yes				1141884	409817				Chloride
Ecology	GroundWater Quality Program	30N/02W-33H	30N/02W-33H	Yes				1127775	390328				Chloride
Ecology	GroundWater Quality Program	30N/02W-35E	30N/02W-35E	Yes				1134295	390152				Chloride
Ecology	GroundWater Quality Program	30N/03W-22K	30N/03W-22K	Yes				1099480	401460				Chloride

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Ecology	GroundWater Quality Program	30N/03W-25F01	30N/03W-25F01	Yes				1109408	397021				Nitrate, Chloride
Ecology	GroundWater Quality Program	30N/03W-27B04	30N/03W-27B04	Yes				1099508	397709				Chloride
Ecology	GroundWater Quality Program	30N/03W-27C	30N/03W-27C	Yes				1098434	398145				Chloride
Ecology	GroundWater Quality Program	30N/03W-27G	30N/03W-27G	Yes				1099700	397298				Chloride
Ecology	GroundWater Quality Program	30N/03W-34A01	30N/03W-34A01	Yes				1100369	392210				Chloride
Ecology	GroundWater Quality Program	30N/03W-36F	30N/03W-36F	Yes				1108233	391479				Chloride
Ecology	GroundWater Quality Program	30N/03W-36F	30N/03W-36F	Yes				1108292	391173				Chloride
Ecology	GroundWater Quality Program	30N/03W-36F05	30N/03W-36F05	Yes				1108711	391567				Chloride
Ecology	GroundWater Quality Program	30N/03W-36L02	30N/03W-36L02	Yes				1108739	390147				Chloride
Ecology	Long-term Marine Water Quality Monitoring Program	DIS001	Discovery Bay - Near Mill Point		1990-1991; 1996-1997, 2000	48.0183	-122.8467					-42 m	Coliform, Nutrients, General
Ecology	Long-term Marine Water Quality Monitoring Program	PTH005	Port Townsend Harbor - Walan Point	Yes	1977-1987; 1991-2001	48.0833	-122.7633					-33 m	Coliform, Nutrients, General
Ecology	Long-term Marine Water Quality Monitoring Program	JDF007	Strait of Juan de Fuca - Sequim Bay, Goose Point		1990-1991; 1993	48.0483	-123.0083					-15 m	Coliform, Nutrients, General
Ecology	Long-term Marine Water Quality Monitoring Program	JDF005	Strait of Juan de Fuca - Sequim Bay		1976-1987; 1990-1991; 1993-1994	48.0617	-123.0300					-39 m	Coliform, Nutrients, General
Ecology	Long-term Marine Water Quality Monitoring Program	SEQ002	Sequim Bay - Northern		2000	48.0767	-123.0167					-26 m	Coliform, Nutrients, General
Ecology	Long-term Marine Water Quality Monitoring Program	ADM002	Admiralty Inlet (north) - Quimper Pn	Yes	1988-2001	48.1875	-122.8417						
Ecology	River and Stream Flow Monitoring	17D060	Little Quilcene nr Mouth	Y	Sept 2002 - Present	47 49' 48" N	122 52' 28" W			15 minutes			Flow
Ecology	River and Stream Flow Monitoring	17A060	Big Quilcene R. nr Mouth	Y	Oct 1998 - Present	47 49' 06" N	122 52' 56" W			15 minutes			Flow
Ecology	River and Stream Flow Monitoring	17C070	Jimmycomelately Cr nr Mouth	N	Oct 1999 - Sept 2001	48 01' 14" N	123 00' 14" W			15 minutes			Flow
Ecology	River and Stream Flow Monitoring	17E060	Snow Creek @ WDFW	Y	Sept 2002 - Present	47 59' 05" N	122 53' 07" W			15 minutes			Flow
Ecology	River and Stream Flow Monitoring	17F060	Salmon Ck. @ West Uncas Rd.	Y	Sept 2002 - Present	47 58' 50" N	122 53' 43" W			15 minutes			Flow
Ecology	River and Stream WQ Monitoring	17A060	Big Quilcene R nr Mouth	Y	2000-2001	47.8184	122.874			Monthly; Flow every	n/a	10	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Ecology	River and Stream WQ Monitoring	17A070	Big Quilcene R nr Quilcene	N	1959-66, 1972-74, 1994, 1999	47.8108	122.9092			Monthly	66.4	120	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Ecology	River and Stream WQ Monitoring	17B070	Chimacum Cr nr Irontdale	N	1994	48.0419	122.7814			Monthly	0	40	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Ecology	River and Stream WQ Monitoring	17B090	Chimacum Cr @ Hadlock	N	1973	48.0308	122.7756			Monthly	30	80	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Ecology	River and Stream WQ Monitoring	17B100	Chimacum Cr @ Chimacum	N	1994	48.0118	122.7733			Monthly	0	100	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Ecology	River and Stream WQ Monitoring	17B110	Chimacum Cr nr Chimacum	N	1973	47.9742	122.7764			Monthly	13.8	120	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Ecology	River and Stream WQ Monitoring	17C070	Jimmycomelately Cr nr Mouth	Y	2000-Present	48.0205	122.7764			Monthly; Flow every	15	10	Cond, FC, Flow, Nitrates, DO, pH, Press, TSS, Temp, Phos,
Jefferson CD	Water Quality and Fish Monitoring Program	AND/0.0	Andrews Cr RM 0.0	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	AND/0.8-1.5	Andrews Cr RM 0.8-1.5	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	AND/0.84	Andrews Cr RM 0.84	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	AND/1.0	Andrews Cr RM 1.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	AND/1.6	Andrews Cr RM 1.6	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	AND/1.6-2.0	Andrews Cr RM 1.6-2.0	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	AND/1.6-2.00	Andrews Cr RM 1.6-2.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	AND/1.71	Andrews Cr RM 1.71	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	AND/2.0	Andrews Cr RM 2.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	AND/2.2	Andrews Cr RM 2.2	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	AND/3.8	Andrews Cr RM 3.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	BH/0.0	Barnhouse Cr RM 0.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	BH/0.0-0.1	Barnhouse Cr RM 0.0-0.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	BH/0.66	Barnhouse Cr RM 0.66	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	BH/0.70	Barnhouse Cr RM 0.70	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	BH/0.8-1.0	Barnhouse Cr RM 0.8-1.0	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	BH/1.0	Barnhouse Cr RM 1.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	BH/1.0-1.1	Barnhouse Cr RM 1.0-1.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	BH/1.1-1.2	Barnhouse Cr RM 1.1-1.2	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	BI/0.2-0.3	Bishop Tributary RM 0.2-4	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	BQ/0.64	Big Quilcene R RM 0.64	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	BQ/2.8	Big Quilcene R RM 2.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	BQ/4.06	Big Quilcene R RM 4.06	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CA/LP	Tarboo Cr	Yes									Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CD/0.2	Cemetary Drain RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CD/0.4	Cemetary Drain RM 0.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.0	Chimacum Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.07/G20	Chimacum Cr RM 0.07 G	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.1	Chimacum Cr RM 0.1	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.27/G21	Chimacum Cr RM 0.27 G	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.27/G22	Chimacum Cr RM 0.27 G	Yes	1998 - Present								Water Quality

Table 8-Stations

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.34/G23	Chimacum Cr RM 0.34 G23	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/0.34/G24	Chimacum Cr RM 0.34 G24	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/1.1	Chimacum Cr RM 1.1	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/1.2	Chimacum Cr RM 1.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/1.9-2.00	Chimacum Cr RM 1.9-2.0	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/1.9DRB	Chimacum Cr RM 1.9DRB	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/11.6-11.75	Chimacum Cr RM 11.6-11	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/11.75-11.8	Chimacum Cr RM 11.75-1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/11.8	Chimacum Cr RM 11.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/11.8-11.96	Chimacum Cr RM 11.8-11	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/11.96-12.23	Chimacum Cr RM 11.96-1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/12.39-12.58	Chimacum Cr RM 12.39-1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/12.5	Chimacum Cr RM 12.5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/12.7-12.8	Chimacum Cr RM 12.7-12	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/12.8-13.05	Chimacum Cr RM 12.8-13	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/12.9	Chimacum Cr RM 12.9	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/2.0	Chimacum Cr RM 2.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/2.3	Chimacum Cr RM 2.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/2.35	Chimacum Cr RM 2.35	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/2.8-2.9	Chimacum Cr RM 2.8-2.9	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/2.94-3.06	Chimacum Cr RM 2.94-3.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.0	Chimacum Cr RM 3.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.0/G28	Chimacum Cr RM 3.0 G28	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.0/G29	Chimacum Cr RM 3.0 G29	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.0/G30	Chimacum Cr RM 3.0 G30	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.4	Chimacum Cr RM 3.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.8	Chimacum Cr RM 3.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.8-3.9	Chimacum Cr RM 3.8-3.9	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.9	Chimacum Cr RM 3.9	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.91	Chimacum Cr RM 3.91	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/3.9-4.0	Chimacum Cr RM 3.9-4.0	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.3	Chimacum Cr RM 5.3	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.34	Chimacum Cr RM 5.34	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.3-5.7	Chimacum Cr RM 5.3-5.7	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.36	Chimacum Cr RM 5.36	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.70-5.73	Chimacum Cr RM 5.70-5.7	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.73	Chimacum Cr RM 5.73	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.73-5.92	Chimacum Cr RM 5.73-5.9	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.98-5.99	Chimacum Cr RM 5.98-5.9	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/5.99-6.10	Chimacum Cr RM 5.99-6.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.0	Chimacum Cr RM 6.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.1	Chimacum Cr RM 6.1	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.10-6.13	Chimacum Cr RM 6.10-6.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.2	Chimacum Cr RM 6.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.2-6.5	Chimacum Cr RM 6.2-6.5	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.5	Chimacum Cr RM 6.5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/6.7	Chimacum Cr RM 6.7	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/7.0	Chimacum Cr RM 7.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/7.8	Chimacum Cr RM 7.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/8.2	Chimacum Cr RM 8.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/8.3	Chimacum Cr RM 8.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/8.4	Chimacum Cr RM 8.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/8.6	Chimacum Cr RM 8.6	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/8.8	Chimacum Cr RM 8.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/8.98-9.20	Chimacum Cr RM 8.98-9.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.0	Chimacum Cr RM 9.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.0W	Chimacum Cr RM 9.0W	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.20-9.38	Chimacum Cr RM 9.20-9.3	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.3	Chimacum Cr RM 9.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.3/G26	Chimacum Cr RM 9.3 G26	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.3/G27	Chimacum Cr RM 9.3 G27	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.38-9.40	Chimacum Cr RM 9.38-9.40	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.4	Chimacum Cr RM 9.4	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	CH/9.40-9.44	Chimacum Cr RM 9.40-9.44	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	CJ/0.2-0.4	Carl Johnson Cr RM 0.2-0.4	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	D1	Ditch 1	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	D2	Ditch 2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	D3	Ditch 3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	D4	Ditch 4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	D5	Ditch 5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	D6	Ditch 6	Yes	1998 - Present								Water Quality

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson CD	Water Quality and Fish Monitoring Program	D7	Ditch 7	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	DV/0.0-0.4	Donovan Cr RM 0.0-0.4	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	DV/0.1	Donovan Cr RM 0.1	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	DV/0.4	Donovan Cr RM 0.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	DV/0.4-0.6	Donovan Cr RM 0.4-0.6	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	DV/0.5	Donovan Cr RM 0.5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	DV/1.5	Donovan Cr RM 1.5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	DV/1.9	Donovan Cr RM 1.9	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/0.1	E Chimacum Cr RM 0.1	Yes	1998 - Present								Fish, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/0.2	E Chimacum Cr RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/0.65-0.74	E Chimacum Cr RM 0.65-0.74	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/0.7	E Chimacum Cr RM 0.7	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/0.9-1.0	E Chimacum Cr RM 0.9-1.0	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.0	E Chimacum Cr RM 1.0	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.0-1.2	E Chimacum Cr RM 1.0-1.2	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.2	E Chimacum Cr RM 1.24-1.33	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.24-1.33	E Chimacum Cr RM 1.24-1.33	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.3	E Chimacum Cr RM 1.3	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.77-1.86	E Chimacum Cr RM 1.77-1.86	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/1.8	E Chimacum Cr RM 1.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/2.19-2.21	E Chimacum Cr RM 2.19-2.21	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/2.2	E Chimacum Cr RM 2.2	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/2.78-2.80	E Chimacum Cr RM 2.78-2.80	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/2.8	E Chimacum Cr RM 2.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/3.3	E Chimacum Cr RM 3.3	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/4.3-4.4	E Chimacum Cr RM 4.3-4.4	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/4.8	E Chimacum Cr RM 4.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/5.1-5.3	E Chimacum Cr RM 5.1-5.3	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/5.3	E Chimacum Cr RM 5.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/5.3-5.6	E Chimacum Cr RM 5.3-5.6	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	ECH/5.4	E Chimacum Cr RM 5.4	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	EHO/0.0	E Houck Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	EHO/0.2	E Houck Cr RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/B	Chimacum Hatchery B	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/BLT	Chimacum Hatchery BLT	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/BRT	Chimacum Hatchery BRT	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/EP	Chimacum Hatchery EP	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/HR	Chimacum Hatchery HR	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/P1	Chimacum Hatchery P1	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/P2	Chimacum Hatchery P2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	H/CH/PD	Chimacum Hatchery PD	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	HO/0.0	Houck Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	HO/0.02	Houck Cr RM 0.02	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	HO/0.1	Houck Cr RM 0.1	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	IN/0.00-0.15	Indian George Cr RM 0.00-0.15	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	IN/0.15-0.20	Indian George Cr RM 0.15-0.20	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	IN/0.2	Indian George Cr RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.0	Jakeway Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.0-0.1	Jakeway Cr RM 0.0-0.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.1	Jakeway Cr RM 0.1	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.1-0.4	Jakeway Cr RM 0.1-0.4	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.2	Jakeway Cr RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.24	Jakeway Cr RM 0.24	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.25	Jakeway Cr RM 0.25	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.25P	Jakeway Cr RM 0.25P	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.26	Jakeway Cr RM 0.26	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.3	Jakeway Cr RM 0.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JK/0.4	Jakeway Cr RM 0.4	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	JKT/0.0	Jakeway Cr Trib RM 0.0	Yes	1998 - Present								Water Quality

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson CD	Water Quality and Fish Monitoring Program	JN/0.0	Johnson Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	JN/1.2	Johnson Cr RM 1.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/HWY101	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/LELCK	Leland Cr LELCK	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/MR/5684	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/MR/6929	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/SCR/2692	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/SCR/2989	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/SCR/3365	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/SCR/4366	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	L/WLVR/23	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LA/0.3	Larrance Cr RM 0.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD/0.0	Ludlow Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD/0.0-0.2	Ludlow Cr RM 0.0-0.2	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LD/0.2-0.5	Ludlow Cr RM 0.2-0.5	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LD/0.5-1.0	Ludlow Cr RM 0.5-1.0	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LD/1.0	Ludlow Cr RM 1.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD/1.1-1.2	Ludlow Cr RM 1.1-1.2	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LD/1.1P	Pond	Yes									Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LD1	Shine Creek	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD11	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD21	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD31	Unnamed Ditch	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD4	Ludlow Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD41	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD51	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD6	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD61	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD7	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD71	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LD8	Unnamed Cr	Yes									Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LL/0078/0.07-0.10	Leland Cr Trib 0078 RM 0.07-0.10	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LL/0078/0.10-0.13	Leland Cr Trib 0078 RM 0.10-0.13	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	LL/2.9	Leland Cr RM 2.9	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LL/3.5	Leland Cr RM 3.5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LL/3.95	Leland Cr RM 3.95	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LL/4.0	Leland Cr RM 4.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	LL/4.1-5.3	Lake Leland	Yes									
Jefferson CD	Water Quality and Fish Monitoring Program	LQ/0.8	Little Quilcene R RM 0.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.0-0.2	Naylors Cr RM 0.0-0.2	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.1	Naylors Cr RM 0.1	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.2	Naylors Cr RM 0.2	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.5-0.7	Naylors Cr RM 0.5-0.7	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.5P	Naylors Cr RM 0.5P	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.7	Naylors Cr RM 0.7	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	NA/0.7	Naylors Cr RM 0.7	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.0	Put aansuu Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.0	Put aansuu Cr RM 0.0	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.0-0.1	Put aansuu Cr RM 0.0-0.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.0-0.38	Put aansuu Cr RM 0.0-0.38	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.1-0.38	Put aansuu Cr RM 0.1-0.38	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.38-0.40	Put aansuu Cr RM 0.38-0.40	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.4	Put aansuu Cr RM 0.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.40-0.50	Put aansuu Cr RM 0.40-0.50	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.40P	Put aansuu Cr RM 0.40P	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	PU/0.5	Put aansuu Cr RM 0.5	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	RA/0.00-0.01	Radka Cr RM 0.00-0.01	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	RA/0.01-0.02	Radka Cr RM 0.01-0.02	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	RA/0.02-0.10	Radka Cr RM 0.02-0.10	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	Rock Lake	Rock Lake	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SA/0.0	Salmon Cr RM 0.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SA/0.1	Salmon Cr RM 0.1	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	SA/0.7	Salmon Cr RM 0.7	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	SA/1.0	Salmon Cr RM 1.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SA/2.7	Salmon Cr RM 2.7	Yes	1998 - Present								
Jefferson CD	Water Quality and Fish Monitoring Program	SN/0.1	Snow Cr RM 0.1	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	SN/0.19	Snow Cr RM 0.19	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SN/0.2	Snow Cr RM 0.2	Yes	1998 - Present								Water Quality, Temperature

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson CD	Water Quality and Fish Monitoring Program	SN/1.6	Snow Cr RM 1.6	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	SN/3.5	Snow Cr RM 3.5	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SN/4.4	Snow Cr RM 4.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SN/7.0	Snow Cr RM 7.0	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	SW/0.39-0.52	Swansonville Cr RM 0.39-0.52	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	TB/0.9	Tarboo Cr RM 0.9	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	TB/2.4	Tarboo Cr RM 2.4	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	TB/2.6	Tarboo Cr RM 2.6	Yes	1998 - Present								Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	TB/2.90-3.05	Tarboo Cr RM 2.90-3.05	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	TB/3.05-3.20	Tarboo Cr RM 3.05-3.20	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	TB/3.8	Tarboo Cr RM 3.8	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	TB/4.0	Tarboo Cr RM 4.0	Yes	1998 - Present								Water Quality, Temperature
Jefferson CD	Water Quality and Fish Monitoring Program	TB/4.2-4.3	Tarboo Cr RM 4.2-4.3	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	YA/0.0-0.2	Yarr Cr RM 0.0-0.2	Yes	1998 - Present								Fish
Jefferson CD	Water Quality and Fish Monitoring Program	YA/0.2	Yarr Cr RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ZE/0.2	Zerr Drain RM 0.2	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ZE/0.3	Zerr Drain RM 0.3	Yes	1998 - Present								Water Quality
Jefferson CD	Water Quality and Fish Monitoring Program	ZE2	Zerr Drain	Yes									Water Quality
Jefferson EHD	Drinking Water Program	JEHD-1	JEHD-1	Yes				1136382	310184				Nitrate
Jefferson EHD	Drinking Water Program	JEHD-2	JEHD-2	Yes				1141998	312498				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	JEHD-3	JEHD-3	Yes				1143304	409539				Nitrate
Jefferson EHD	Drinking Water Program	JEHD-4	JEHD-4	Yes				1146998	412779				Nitrate
Jefferson EHD	Drinking Water Program	JEHD-5	JEHD-5	Yes				1155025	394221				Nitrate
Jefferson EHD	Drinking Water Program	JEHD-6	JEHD-6	Yes				1180781	363364				Chloride
Jefferson EHD	Drinking Water Program	JEHD-7	JEHD-7	Yes				1185613	355642				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	JEHD-8	JEHD-8	Yes				1186168	322559				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	JEHD-9	JEHD-9	Yes				1187452	392616				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	JEHD-10	JEHD-10	Yes				1192008	333898				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	JEHD-11	JEHD-11	Yes				1196924	328902				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	22N/01W-21SWSE	22N/01W-21SWSE	Yes				1159943	369961				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	25N/01W-03SESE	25N/01W-03SESE	Yes				1159406	257374				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	25N/01W-03SWNE	25N/01W-03SWNE	Yes				1159628	257367				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	25N/01W-04NESW	25N/01W-04NESW	Yes				1152961	256063				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	25N/01W-05NWNW	25N/01W-05NWNW	Yes				1148991	258214				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01E-27SW	26N/01E-27SW	Yes				1158734	266126				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-03SESE	26N/01W-03SESE	Yes				1161616	286086				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-03SWNW	26N/01W-03SWNW	Yes				1158439	288158				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-03SWNW	26N/01W-03SWNW	Yes				1159322	290183				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-07NWNW	26N/01W-07NWNW	Yes				1143985	281211				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-07SENW	26N/01W-07SENW	Yes				1143044	284759				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-07SESE	26N/01W-07SESE	Yes				1143987	281343				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-07SWNW	26N/01W-07SWNW	Yes				1141941	284394				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-07SWSE	26N/01W-07SWSE	Yes				1144053	282017				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-07SWSW	26N/01W-07SWSW	Yes				1141212	281942				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-09WSW	26N/01W-09WSW	Yes				1156887	282458				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-09WSW	26N/01W-09WSW	Yes				1157588	282437				Chloride
Jefferson EHD	Drinking Water Program	26N/01W-10SE	26N/01W-10SE	Yes				1160869	282305				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-11N 1/2SE	26N/01W-11N 1/2SE	Yes				1160857	282056				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-27NESW	26N/01W-27NESW	Yes				1158718	266700				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-28SENE	26N/01W-28SENE	Yes				1155538	268259				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-32NWNW	26N/01W-32NWNW	Yes				1150452	264475				Nitrate
Jefferson EHD	Drinking Water Program	26N/01W-32SENE	26N/01W-32SENE	Yes				1150057	262549				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-33NENW	26N/01W-33NENW	Yes				1134957	315335				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-33NESW	26N/01W-33NESW	Yes				1152737	261704				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/01W-33SWSE	26N/01W-33SWSE	Yes				1154418	258769				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/02W-07SWNW	26N/02W-07SWNW	Yes				1141275	284400				Nitrate
Jefferson EHD	Drinking Water Program	26N/02W-15NENW	26N/02W-15NENW	Yes				1132174	312961				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	26N/02W-23NWSE	26N/02W-23NWSE	Yes				1135481	274312				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-03NENE	27N/01E-03NENE	Yes				1193543	321576				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-03NENE	27N/01E-03NENE	Yes				1193546	321668				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-03NWNW	27N/01E-03NWNW	Yes				1191353	321729				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-03NWNW	27N/01E-03NWNW	Yes				1191554	321699				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-04SWNW	27N/01E-04SWNW	Yes				1183773	320927				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-16NWNW	27N/01E-16NWNW	Yes				1183670	310830				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-16SWNW	27N/01E-16SWNW	Yes				1183629	310080				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-17SWSE	27N/01E-17SWSE	Yes				1181091	307393				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-19NESE	27N/01E-19NESE	Yes				1174714	303486				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-19NESW	27N/01E-19NESW	Yes				1174571	301868				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-19NESW	27N/01E-19NESW	Yes				1183193	308718				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-19NWSE	27N/01E-19NWSE	Yes				1174660	301879				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-19NWSE	27N/01E-19NWSE	Yes				1175218	301937				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-19SE	27N/01E-19SE	Yes				1176913	303295				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01E-20SWNW	27N/01E-20SWNW	Yes				1179643	305562				Nitrate
Jefferson EHD	Drinking Water Program	27N/01E-20SWNW	27N/01E-20SWNW	Yes				1179705	305644				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-05SWNE	27N/01W-05SWNE	Yes				1149884	321444				Nitrate

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson EHD	Drinking Water Program	27N/01W-06SENE	27N/01W-06SENE	Yes				1146396	321016				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-10NWSE	27N/01W-10NWSE	Yes				1160767	313431				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-10SWSE	27N/01W-10SWSE	Yes				1160461	312439				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-15SESW	27N/01W-15SESW	Yes				1158135	308650				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-16	27N/01W-16	Yes				1184505	308790				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-17NWSW	27N/01W-17NWSW	Yes				1151653	308041				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-17NWSW	27N/01W-17NWSW	Yes				1151989	308131				Chloride
Jefferson EHD	Drinking Water Program	27N/01W-18NESE	27N/01W-18NESE	Yes				1146409	308007				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-18SENW	27N/01W-18SENW	Yes				1142716	310236				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-19NENE	27N/01W-19NENE	Yes				1146101	306176				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-19SESE	27N/01W-19SESE	Yes				1145324	303388				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-19SESE	27N/01W-19SESE	Yes				1146260	302409				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-20NESE	27N/01W-20NESE	Yes				1151575	303216				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-20SENE	27N/01W-20SENE	Yes				1151054	307180				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-20SWNE	27N/01W-20SWNE	Yes				1151127	307430				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-22SENW	27N/01W-22SENW	Yes				1159272	306090				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-25NENW	27N/01W-25NENW	Yes				1170003	300145				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-25NESW	27N/01W-25NESW	Yes				1168925	297603				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-25NESW	27N/01W-25NESW	Yes				1169720	299273				Chloride
Jefferson EHD	Drinking Water Program	27N/01W-26NENW	27N/01W-26NENW	Yes				1170452	295373				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-27NESW	27N/01W-27NESW	Yes				1157564	266043				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-31SESW	27N/01W-31SESW	Yes				1145580	291134				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-32SESW	27N/01W-32SESW	Yes				1147353	292110				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-32SW	27N/01W-32SW	Yes				1148642	292275				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-32SW	27N/01W-32SW	Yes				1149053	292222				Chloride
Jefferson EHD	Drinking Water Program	27N/01W-32SWSW	27N/01W-32SWSW	Yes				1149795	293556				Nitrate
Jefferson EHD	Drinking Water Program	27N/01W-34NESE	27N/01W-34NESE	Yes				1162110	293314				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-35SENW	27N/01W-35SENW	Yes				1164186	292987				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/01W-35SENW	27N/01W-35SENW	Yes				1164736	292363				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-02NW	27N/02W-02NW	Yes				1133543	322603				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-02NWSE	27N/02W-02NWSE	Yes				1133741	319591				Chloride
Jefferson EHD	Drinking Water Program	27N/02W-02NWSE	27N/02W-02NWSE	Yes				1134323	319649				Nitrate
Jefferson EHD	Drinking Water Program	27N/02W-10NESE	27N/02W-10NESE	Yes				1130834	313200				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-13NENE	27N/02W-13NENE	Yes				1141122	311433				Nitrate
Jefferson EHD	Drinking Water Program	27N/02W-13NESW	27N/02W-13NESW	Yes				1137848	308854				Nitrate
Jefferson EHD	Drinking Water Program	27N/02W-13NWSW	27N/02W-13NWSW	Yes				1135170	307941				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-14NESW	27N/02W-14NESW	Yes				1134632	309481				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-14NWNW	27N/02W-14NWNW	Yes				1132507	311893				Nitrate
Jefferson EHD	Drinking Water Program	27N/02W-14SWNE	27N/02W-14SWNE	Yes				1137683	309697				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-14SWNE	27N/02W-14SWNE	Yes				1137988	309689				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-14SWNE	27N/02W-14SWNE	Yes				1138657	309710				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-14SWSW	27N/02W-14SWSW	Yes				1133232	309509				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-22	27N/02W-22	Yes				1130039	303328				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-24NENE	27N/02W-24NENE	Yes				1140244	307126				Chloride
Jefferson EHD	Drinking Water Program	27N/02W-24NENE	27N/02W-24NENE	Yes				1140485	306767				Chloride
Jefferson EHD	Drinking Water Program	27N/02W-24NESE	27N/02W-24NESE	Yes				1138392	303074				Chloride
Jefferson EHD	Drinking Water Program	27N/02W-24NESW	27N/02W-24NESW	Yes				1138395	304217				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-24SESW	27N/02W-24SESW	Yes				1137550	303085				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-25SENE	27N/02W-25SENE	Yes				1139946	301330				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	27N/02W-27NWNW	27N/02W-27NWNW	Yes				1127176	302112				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01-04NWNW	28N/01-04NWNW	Yes				1153439	353895				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-06NENE	28N/01E-06NENE	Yes				1177785	352716				Chloride
Jefferson EHD	Drinking Water Program	28N/01E-06NENE	28N/01E-06NENE	Yes				1178464	351680				Chloride
Jefferson EHD	Drinking Water Program	28N/01E-06NESW	28N/01E-06NESW	Yes				1175641	348914				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-06SESW	28N/01E-06SESW	Yes				1176009	350331				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-06SESW	28N/01E-06SESW	Yes				1176600	349895				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-07	28N/01E-07	Yes				1175426	343912				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-07SWNW	28N/01E-07SWNW	Yes				1174485	346346				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-08NWNW	28N/01E-08NWNW	Yes				1180150	347755				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-15NWSE	28N/01E-15NWSE	Yes				1193578	338657				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-15SWNE	28N/01E-15SWNE	Yes				1193864	340858				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-15SWSE	28N/01E-15SWSE	Yes				1193186	338015				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-15SWSE	28N/01E-15SWSE	Yes				1193198	338613				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-16NWSE	28N/01E-16NWSE	Yes				1186986	338869				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-16SWSW	28N/01E-16SWSW	Yes				1188212	339278				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-18SENW	28N/01E-18SENW	Yes				1176517	341391				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-18SWNW	28N/01E-18SWNW	Yes				1174678	341490				Chloride
Jefferson EHD	Drinking Water Program	28N/01E-18SWNW	28N/01E-18SWNW	Yes				1175645	341427				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-22	28N/01E-22	Yes				1193314	336018				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-22NESE	28N/01E-22NESE	Yes				1193312	335722				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-22SWNE	28N/01E-22SWNE	Yes				1193321	335653				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-23SESE	28N/01E-23SESE	Yes				1185929	322400				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-26NWNW	28N/01E-26NWNW	Yes				1195597	331121				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-26SENW	28N/01E-26SENW	Yes				1196271	329502				Chloride
Jefferson EHD	Drinking Water Program	28N/01E-26SENW	28N/01E-26SENW	Yes				1196442	330034				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-26SENW	28N/01E-26SENW	Yes				1197029	329349				Chloride

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson EHD	Drinking Water Program	28N/01E-26SENW	28N/01E-26SENW	Yes				1197160	329843				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-26SWSE	28N/01E-26SWSE	Yes				1198402	327015				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-26SWSW	28N/01E-26SWSW	Yes				1196868	329932				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-27NENE	28N/01E-27NENE	Yes				1194511	331792				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-33NWSE	28N/01E-33NWSE	Yes				1187725	324345				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-33SENE	28N/01E-33SENE	Yes				1187710	323786				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-34NESW	28N/01E-34NESW	Yes				1188972	323423				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-34NESW	28N/01E-34NESW	Yes				1189135	323415				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-34NESW	28N/01E-34NESW	Yes				1191526	323870				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-34SWSE	28N/01E-34SWSE	Yes				1190033	322721				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-34SWSE	28N/01E-34SWSE	Yes				1192572	321924				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-35NENE	28N/01E-35NENE	Yes				1199032	325847				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-35NESW	28N/01E-35NESW	Yes				1196169	324951				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-35NWNE	28N/01E-35NWNE	Yes				1198047	326251				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-35NWSE	28N/01E-35NWSE	Yes				1197772	323936				Nitrate
Jefferson EHD	Drinking Water Program	28N/01E-35NWSE	28N/01E-35NWSE	Yes				1198410	323930				Chloride
Jefferson EHD	Drinking Water Program	28N/01E-35SENW	28N/01E-35SENW	Yes				1196371	326794				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01E-35SWNE	28N/01E-35SWNE	Yes				1198465	324828				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-02	28N/01W-02	Yes				1167400	353092				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-02NENW	28N/01W-02NENW	Yes				1165883	353319				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-02NWNE	28N/01W-02NWNE	Yes				1167100	353759				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-02NWNE	28N/01W-02NWNE	Yes				1169730	353897				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-02SENE	28N/01W-02SENE	Yes				1152270	300111				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-03NESE	28N/01W-03NESE	Yes				1163388	350858				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-03NWSE	28N/01W-03NWSE	Yes				1163332	352578				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-03SENE	28N/01W-03SENE	Yes				1163412	351872				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-03SWSE	28N/01W-03SWSE	Yes				1161077	350123				Chloride
Jefferson EHD	Drinking Water Program	28N/01W-03SWSE	28N/01W-03SWSE	Yes				1161252	350116				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-03SWSE	28N/01W-03SWSE	Yes				1161338	348848				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-03SWSE	28N/01W-03SWSE	Yes				1161935	348825				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-03SWSE	28N/01W-03SWSE	Yes				1161938	349044				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-03SWSW	28N/01W-03SWSW	Yes				1158971	349361				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-04NESW	28N/01W-04NESW	Yes				1155049	350796				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-04NWSW	28N/01W-04NWSW	Yes				1155076	349858				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-04SESE	28N/01W-04SESE	Yes				1157754	349976				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-04SWNW	28N/01W-04SWNW	Yes				1153713	352744				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-04SWNW	28N/01W-04SWNW	Yes				1154229	350260				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-07NWSE	28N/01W-07NWSE	Yes				1156332	345832				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-10NENE	28N/01W-10NENE	Yes				1162596	348208				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-10NESE	28N/01W-10NESE	Yes				1162595	345047				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-10SWNE	28N/01W-10SWNE	Yes				1161292	347217				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-20NENE	28N/01W-20NENE	Yes				1151438	337754				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-21NWNW	28N/01W-21NWNW	Yes				1153900	337810				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-29NENW	28N/01W-29NENW	Yes				1151914	335548				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-32NENW	28N/01W-32NENW	Yes				1147311	327214				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/01W-32SENE	28N/01W-32SENE	Yes				1152069	325332				Nitrate
Jefferson EHD	Drinking Water Program	28N/01W-33SWSW	28N/01W-33SWSW	Yes				1152659	324482				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/02W-02NWSW	28N/02W-02NWSW	Yes				1137077	351631				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/02W-12NWNW	28N/02W-12NWNW	Yes				1138007	349664				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/02W-24SENW	28N/02W-24SENW	Yes				1136120	321278				Nitrate
Jefferson EHD	Drinking Water Program	28N/02W-24SESW	28N/02W-24SESW	Yes				1139924	334669				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/02W-34NE	28N/02W-34NE	Yes				1131176	328026				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	28N/02W-35	28N/02W-35	Yes				1134003	327968				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-04NENW	29N/01E-04NENW	Yes				1187564	384352				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-04NENW	29N/01E-04NENW	Yes				1188154	385198				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-04NESW	29N/01E-04NESW	Yes				1188156	382317				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-04NWSE	29N/01E-04NWSE	Yes				1188711	381601				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-04SENW	29N/01E-04SENW	Yes				1188126	383559				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-04SESE	29N/01E-04SESE	Yes				1190747	380387				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-05NENE	29N/01E-05NENE	Yes				1184614	384731				Nitrate
Jefferson EHD	Drinking Water Program	29N/01E-05NENE	29N/01E-05NENE	Yes				1184629	384567				Chloride
Jefferson EHD	Drinking Water Program	29N/01E-08NENE	29N/01E-08NENE	Yes				1185293	376788				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-08NENE	29N/01E-08NENE	Yes				1185581	379874				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-08NESE	29N/01E-08NESE	Yes				1184817	375820				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-08NESE	29N/01E-08NESE	Yes				1185299	377038				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-08SESE	29N/01E-08SESE	Yes				1185290	376618				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-08SWNE	29N/01E-08SWNE	Yes				1184151	378004				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09NENW	29N/01E-09NENW	Yes				1187608	377123				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09NESW	29N/01E-09NESW	Yes				1187649	378139				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09NWNW	29N/01E-09NWNW	Yes				1186237	379854				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09NWSE	29N/01E-09NWSE	Yes				1189287	377175				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09SENW	29N/01E-09SENW	Yes				1187216	374918				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09SESW	29N/01E-09SESW	Yes				1187864	375127				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09SESW	29N/01E-09SESW	Yes				1188000	374893				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09SESW	29N/01E-09SESW	Yes				1188055	375913				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-09SW	29N/01E-09SW	Yes				1190313	376213				Nitrate, Chloride

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson EHD	Drinking Water Program	29N/01E-09SWSW	29N/01E-09SWSW	Yes				1185917	375483				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-19	29N/01E-19	Yes				1177556	367196				Nitrate
Jefferson EHD	Drinking Water Program	29N/01E-19	29N/01E-19	Yes				1177658	367687				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-19SWNE	29N/01E-19SWNE	Yes				1178207	368285				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-28SESE	29N/01E-28SESE	Yes				1187601	359466				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-28SESW	29N/01E-28SESW	Yes				1187084	359408				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-29NWNW	29N/01E-29NWNW	Yes				1180323	364012				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-29SENW	29N/01E-29SENW	Yes				1181284	362706				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-32NENE	29N/01E-32NENE	Yes				1186018	356944				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-32NWSE	29N/01E-32NWSE	Yes				1183357	355451				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-32SWSE	29N/01E-32SWSE	Yes				1184190	354358				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-32SWSE	29N/01E-32SWSE	Yes				1184190	354358				Chloride
Jefferson EHD	Drinking Water Program	29N/01E-33NW	29N/01E-33NW	Yes				1187539	356913				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01E-33SWNW	29N/01E-33SWNW	Yes				1185871	356707				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-03SESW	29N/01W-03SESW	Yes				1159794	381443				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-05	29N/01W-05	Yes				1153362	385796				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-08	29N/01W-08	Yes				1151398	377565				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-08NENE	29N/01W-08NENE	Yes				1153103	379186				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-08NWSE	29N/01W-08NWSE	Yes				1151504	377901				Chloride
Jefferson EHD	Drinking Water Program	29N/01W-08SENE	29N/01W-08SENE	Yes				1152393	379509				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-10SWSW	29N/01W-10SWSW	Yes				1159434	375519				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-11SESW	29N/01W-11SESW	Yes				1165281	376120				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-12NESE	29N/01W-12NESE	Yes				1172681	377855				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-15NWNE	29N/01W-15NWNE	Yes				1162895	374231				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-15SWNE	29N/01W-15SWNE	Yes				1163630	371972				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-19SESW	29N/01W-19SESW	Yes				1176456	364770				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-22SENW	29N/01W-22SENW	Yes				1160882	367966				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-23NNE	29N/01W-23NNE	Yes				1168886	369326				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-23SENE	29N/01W-23SENE	Yes				1169303	367818				Chloride
Jefferson EHD	Drinking Water Program	29N/01W-23SENE	29N/01W-23SENE	Yes				1169427	368132				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-23SESW	29N/01W-23SESW	Yes				1166548	367973				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-25NENE	29N/01W-25NENE	Yes				1173963	358913				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-25NESE	29N/01W-25NESE	Yes				1167566	355302				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-25NESE	29N/01W-25NESE	Yes				1174226	362308				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-26SESW	29N/01W-26SESW	Yes				1165871	360173				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-26SWSW	29N/01W-26SWSW	Yes				1164076	361169				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-27	29N/01W-27	Yes				1160882	363636				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-27NWNE	29N/01W-27NWNE	Yes				1160589	363464				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-27SWNW	29N/01W-27SWNW	Yes				1160272	363670				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-30	29N/01W-30	Yes				1182394	360437				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-30	29N/01W-30	Yes				1182588	360560				Chloride
Jefferson EHD	Drinking Water Program	29N/01W-30NESE	29N/01W-30NESE	Yes				1147538	362189				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-31NWNE	29N/01W-31NWNE	Yes				1145112	296339				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/01W-33SESE	29N/01W-33SESE	Yes				1158450	355524				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-34SENW	29N/01W-34SENW	Yes				1160523	358336				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-35NWSE	29N/01W-35NWSE	Yes				1166087	355423				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-35SWNE	29N/01W-35SWNE	Yes				1168479	355935				Nitrate
Jefferson EHD	Drinking Water Program	29N/01W-36SWSE	29N/01W-36SWSE	Yes				1171004	353769				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-04NW	29N/02W-04NW	Yes				1123298	386365				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/02W-04NWNE	29N/02W-04NWNE	Yes				1125528	386336				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/02W-13SWSE	29N/02W-13SWSE	Yes				1140856	372086				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-13SWSE	29N/02W-13SWSE	Yes				1140971	371895				Chloride
Jefferson EHD	Drinking Water Program	29N/02W-22NWSE	29N/02W-22NWSE	Yes				1129906	368371				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-23NWSE	29N/02W-23NWSE	Yes				1135367	366755				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-24NWSE	29N/02W-24NWSE	Yes				1140363	367977				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-24SWSW	29N/02W-24SWSW	Yes				1138925	366390				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	29N/02W-25NWNW	29N/02W-25NWNW	Yes				1138438	365394				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-25NWSE	29N/02W-25NWSE	Yes				1129282	369076				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-25NWSW	29N/02W-25NWSW	Yes				1137441	362084				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-25NWSW	29N/02W-25NWSW	Yes				1137607	362038				Chloride
Jefferson EHD	Drinking Water Program	29N/02W-25SWSW	29N/02W-25SWSW	Yes				1137465	360247				Chloride
Jefferson EHD	Drinking Water Program	29N/02W-25SWSW	29N/02W-25SWSW	Yes				1137848	360348				Nitrate
Jefferson EHD	Drinking Water Program	29N/02W-36SWSW	29N/02W-36SWSW	Yes				1137844	356736				Chloride
Jefferson EHD	Drinking Water Program	30N/01E-05NWNE	30N/01E-05NWNE	Yes				1184792	383597				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-07SWSE	30N/01E-07SWSE	Yes				1148189	408877				Chloride
Jefferson EHD	Drinking Water Program	30N/01E-07SWSE	30N/01E-07SWSE	Yes				1148985	408892				Nitrate
Jefferson EHD	Drinking Water Program	30N/01E-18SESW	30N/01E-18SESW	Yes				1180814	401979				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-19NENE	30N/01E-19NENE	Yes				1180910	401558				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-19NWNE	30N/01E-19NWNE	Yes				1181709	401473				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-20NESE	30N/01E-20NESE	Yes				1185946	397763				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-20NESW	30N/01E-20NESW	Yes				1182064	398548				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-20SENE	30N/01E-20SENE	Yes				1183399	399479				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-20SENW	30N/01E-20SENW	Yes				1183428	400151				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-20SWSE	30N/01E-20SWSE	Yes				1183540	395967				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-28NENW	30N/01E-28NENW	Yes				1187538	393511				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-28NWNW	30N/01E-28NWNW	Yes				1186802	395452				Nitrate, Chloride

TABLE 8

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
Jefferson EHD	Drinking Water Program	30N/01E-28SWNW	30N/01E-28SWNW	Yes				1187265	394355				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-28SWSW	30N/01E-28SWSW	Yes				1186658	391928				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-28SWSW	30N/01E-28SWSW	Yes				1187044	391273				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-29	30N/01E-29	Yes				1184250	394785				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-29SWNE	30N/01E-29SWNE	Yes				1183601	393979				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-32	30N/01E-32	Yes				1183573	389567				Nitrate
Jefferson EHD	Drinking Water Program	30N/01E-32	30N/01E-32	Yes				1184727	390093				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-32NWSE	30N/01E-32NWSE	Yes				1184206	386009				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-32NWSE	30N/01E-32NWSE	Yes				1184435	387818				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-32SENE	30N/01E-32SENE	Yes				1185132	390011				Chloride
Jefferson EHD	Drinking Water Program	30N/01E-32SENW	30N/01E-32SENW	Yes				1184382	389566				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-32SENW	30N/01E-32SENW	Yes				1184551	389567				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-33	30N/01E-33	Yes				1187299	389874				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-33SWNW	30N/01E-33SWNW	Yes				1186884	389484				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01E-33SWNW	30N/01E-33SWNW	Yes				1187695	389320				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-05NW	30N/01W-05NW	Yes				1150542	417095				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-05NW	30N/01W-05NW	Yes				1151142	417147				Chloride
Jefferson EHD	Drinking Water Program	30N/01W-05SWNW	30N/01W-05SWNW	Yes				1149945	417038				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-06NENE	30N/01W-06NENE	Yes				1149163	417714				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-06SWSE	30N/01W-06SWSE	Yes				1147247	413316				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-07NENW	30N/01W-07NENW	Yes				1146201	412618				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-07NWNE	30N/01W-07NWNE	Yes				1147055	412739				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-07NWNE	30N/01W-07NWNE	Yes				1147662	411992				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-07NWSE	30N/01W-07NWSE	Yes				1147241	409338				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-07SENE	30N/01W-07SENE	Yes				1148589	410024				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-07SWNE	30N/01W-07SWNE	Yes				1147301	410998				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-07SWSW	30N/01W-07SWSW	Yes				1144324	408133				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-08	30N/01W-08	Yes				1152447	412806				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-08NESE	30N/01W-08NESE	Yes				1154491	409875				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-08NWSE	30N/01W-08NWSE	Yes				1153169	409898				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-08SENW	30N/01W-08SENW	Yes				1151730	410805				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-09	30N/01W-09	Yes				1155811	408569				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-09SSW	30N/01W-09SSW	Yes				1155517	407738				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-16NESW	30N/01W-16NESW	Yes				1157080	404427				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-16SWNW	30N/01W-16SWNW	Yes				1155101	405379				Chloride
Jefferson EHD	Drinking Water Program	30N/01W-16SWNW	30N/01W-16SWNW	Yes				1155120	405472				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-17SESW	30N/01W-17SESW	Yes				1151045	403209				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-17SESW	30N/01W-17SESW	Yes				1151897	402704				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-17SWNW	30N/01W-17SWNW	Yes				1149662	405282				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-17SWSE	30N/01W-17SWSE	Yes				1152855	403102				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-17SWSE	30N/01W-17SWSE	Yes				1152861	402675				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-17SWSW	30N/01W-17SWSW	Yes				1149583	403032				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-18SWSE	30N/01W-18SWSE	Yes				1147206	402874				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-20NWSW	30N/01W-20NWSW	Yes				1150066	399412				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-20SWNE	30N/01W-20SWNE	Yes				1152744	402175				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-20SWNW	30N/01W-20SWNW	Yes				1150158	397917				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-28SENW	30N/01W-28SENW	Yes				1156680	395025				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-29NENE	30N/01W-29NENE	Yes				1154062	396477				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-29NESW	30N/01W-29NESW	Yes				1150355	396165				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-29SENE	30N/01W-29SENE	Yes				1152740	395723				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-32SENE	30N/01W-32SENE	Yes				1153225	389346				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-32SESE	30N/01W-32SESE	Yes				1154603	404112				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-32SWNE	30N/01W-32SWNE	Yes				1151532	390079				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-33NESE	30N/01W-33NESE	Yes				1156708	387948				Nitrate
Jefferson EHD	Drinking Water Program	30N/01W-34SWNW	30N/01W-34SWNW	Yes				1160505	389322				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/01W-35SWNW	30N/01W-35SWNW	Yes				1164461	389124				Nitrate
Jefferson EHD	Drinking Water Program	30N/02W-12NENE	30N/02W-12NENE	Yes				1144059	413244				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/02W-12NESE	30N/02W-12NESE	Yes				1143035	409542				Nitrate
Jefferson EHD	Drinking Water Program	30N/02W-12NESE	30N/02W-12NESE	Yes				1143305	410653				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/02W-12NESE	30N/02W-12NESE	Yes				1143993	411389				Nitrate
Jefferson EHD	Drinking Water Program	30N/02W-12SENE	30N/02W-12SENE	Yes				1143527	411333				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/02W-12SWNE	30N/02W-12SWNE	Yes				1142434	412072				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/02W-13NENE	30N/02W-13NENE	Yes				1142371	407351				Nitrate
Jefferson EHD	Drinking Water Program	30N/02W-13SENE	30N/02W-13SENE	Yes				1143128	406075				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	30N/02W-34SE	30N/02W-34SE	Yes				1132931	387469				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	31N/01W-31	31N/01W-31	Yes				1149621	418846				Nitrate
Jefferson EHD	Drinking Water Program	31N/01W-31	31N/01W-31	Yes				1150933	418723				Chloride
Jefferson EHD	Drinking Water Program	31N/01W-32NWSE	31N/01W-32NWSE	Yes				1152115	419660				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	31N/01W-32NWSW	31N/01W-32NWSW	Yes				1150288	418647				Nitrate
Jefferson EHD	Drinking Water Program	31N/01W-32NWSW	31N/01W-32NWSW	Yes				1150953	418588				Chloride
Jefferson EHD	Drinking Water Program	31N/01W-32SWSW	31N/01W-32SWSW	Yes				1150306	418511				Nitrate, Chloride
Jefferson EHD	Drinking Water Program	N/0-0NWNW	N/0-0NWNW	Yes				1180781	363364				Nitrate
MISC		Bridgehaven Water System	Bridgehaven Water System	Yes				1184649	312513				Chloride
MISC		City of Port Townsend Kivley Well	City of Port Townsend Kivley Wel	Yes				1169252	381848				Nitrate, Chloride

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
MISC		City of Port Townsend Sparling Well	City of Port Townsend Sparling Well	Yes				1161345	385956				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Hendrickson Well	Hendrickson Well	Yes				1192590	325395				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program/JC PUD	Hill Well	Hill Well	No	1994-1995			1186038	322965				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Hodges Well	Hodges Well	Yes				1193910	325395				Chloride
MISC		Hood Canal Seafood Oyster Co	Hood Canal Seafood Oyster Co	Yes				1136794	304385				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program/JCWD	Jeff Co Water District Paradise	Jeff Co Water District Paradise	Yes				1191423	329330				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program/JC PUD	Jeff PUD Bywater Bay Well 1	Jeff PUD Bywater Bay Well 1 (Shi	Yes				1189950	325395				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program/JC PUD	Jeff PUD Bywater Bay Well 2	Jeff PUD Bywater Bay Well 2 (Pop	Yes				1195218	326701				Nitrate, Chloride
MISC		Jeff PUD Gardiner Well 1	Jeff PUD Gardiner Well 1	Yes				1126057	393825				Nitrate, Chloride
MISC		Jeff PUD Glen Cove South Well 1	Jeff PUD Glen Cove South Well 1	Yes				1158861	391302				Nitrate, Chloride
MISC		Jeff PUD Glen Cove South Well 2a	Jeff PUD Glen Cove South Well 2a	Yes				1156221	388662				Nitrate, Chloride
MISC		Jeff PUD Glen Cove South Well 3	Jeff PUD Glen Cove South Well 3	Yes				1164121	391169				Nitrate, Chloride
MISC		Kala Point Water System	Kala Point Water System	Yes				1165304	392456				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Neault Well	Neault Well	Yes				1194064	341292				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 12	Port Ludlow Well 12	Yes				1183524	332270				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 13	Port Ludlow Well 13	Yes				1188921	333494				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 14	Port Ludlow Well 14	Yes				1188921	333494				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 2	Port Ludlow Well 2	Yes				1181422	344124				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 3	Port Ludlow Well 3	Yes				1184062	345444				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 4A	Port Ludlow Well 4A	Yes				1187601	334814				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 4N	Port Ludlow Well 4N	Yes				1182742	344124				Nitrate, Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Port Ludlow Well 9	Port Ludlow Well 9	Yes				1187601	334814				Chloride
MISC		Quilcene Admin Site	Quilcene Admin Site	Yes				1136794	307025				Chloride
MISC		Quilcene National Fish Hatchery	Quilcene National Fish Hatchery	Yes				1128296	303180				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Shine Plat Well 2	Shine Plat Well 2	Yes				1184718	322965				Chloride
MISC	Port Ludlow Area Groundwater Monitoring Program	Woodruff Well	Woodruff Well	Yes				1182742	346764				Chloride
Port Townsend	Streamflow Monitoring	Big Quilcene	Big Quilcene	Yes	1993-present								
Port Townsend	Streamflow Monitoring	Little Quilcene River at	Little Quilcene River at	Yes	1994 -present					Daily Flow			Flow
Port Townsend	Streamflow Monitoring	Chimacum Creek	Chimacum Creek	Yes	1998 - Present					Daily Flow			Flow
S'Klallam	Stream Temperature Monitoring Program	Marple	Marple	Yes				1137371.615	276859.3316				Temperature
S'Klallam	Stream Temperature Monitoring Program	Spencer	Spencer	Yes				1137424.621	278926.5596				Temperature
S'Klallam	Stream Temperature Monitoring Program	Big Quilcene, Lower	Big Quilcene, Lower	Yes				1138643.755	305005.4369				Temperature
S'Klallam	Stream Temperature Monitoring Program	Big Quilcene, Middle	Big Quilcene, Middle	Yes				1130480.854	302673.1796				Temperature
S'Klallam	Stream Temperature Monitoring Program	Big Quilcene, Upper	Big Quilcene, Upper	Yes				1125233.275	294934.3258				Temperature
S'Klallam	Stream Temperature Monitoring Program	Penny	Penny	Yes				1125710.328	304952.4311				Temperature
S'Klallam	Stream Temperature Monitoring Program	Little Quilcene, Lower	Little Quilcene, Lower	Yes				1135834.445	312373.2498				Temperature
S'Klallam	Stream Temperature Monitoring Program	Little Quilcene, Upper	Little Quilcene, Upper	Yes				1126558.422	323822.5131				Temperature
S'Klallam	Stream Temperature Monitoring Program	Leland	Leland	Yes				1136735.545	315818.63				Temperature
S'Klallam	Stream Temperature Monitoring Program	Ripley	Ripley	Yes				1132124.036	323451.4721				Temperature
S'Klallam	Stream Temperature Monitoring Program	Howe	Howe	Yes				1127671.545	327320.899				Temperature
S'Klallam	Stream Temperature Monitoring Program	Donavan	Donavan	Yes				1142301.159	310253.0159				Temperature
S'Klallam	Stream Temperature Monitoring Program	EF Tarboo	EF Tarboo	Yes				1156347.708	323557.4838				Temperature
S'Klallam	Stream Temperature Monitoring Program	Thorndyke	Thorndyke	Yes				1172143.451	306224.5715				Temperature
S'Klallam	Stream Temperature Monitoring Program	Nordstrom	Nordstrom	Yes				1182638.609	309139.8931				Temperature
S'Klallam	Stream Temperature Monitoring Program	Shine	Shine	Yes				1180041.323	325253.671				Temperature
S'Klallam	Stream Temperature Monitoring Program	Ludlow	Ludlow	Yes				1179405.252	340307.3318				Temperature
S'Klallam	Stream Temperature Monitoring Program	Chimacum, Upper	Chimacum, Upper	Yes				1158043.896	349371.3319				Temperature
S'Klallam	Stream Temperature Monitoring Program	Chimacum, Lower	Chimacum, Lower	Yes				1163609.51	386157.3905				Temperature
S'Klallam	Stream Temperature Monitoring Program	Chimacum, Main	Chimacum, Main	Yes				1165676.738	373966.0455				Temperature
S'Klallam	Stream Temperature Monitoring Program	EF Chimacum	EF Chimacum	Yes				1168062.001	374072.0572				Temperature
S'Klallam	Stream Temperature Monitoring Program	Tarboo	Tarboo	Yes				1152088.63	333238.6101				Temperature
S'Klallam	Stream Temperature Monitoring Program	Spencer, Upper (old)	Spencer, Upper (old)	Yes				1133745.59	281662.3623				Temperature
S'Klallam	Stream Temperature Monitoring Program	WF Thorndyke	WF Thorndyke	Yes				1171377.734	306311.1127				Temperature
S'Klallam	Stream Temperature Monitoring Program	EF Thorndyke	EF Thorndyke	Yes				1171700.527	307690.3174				Temperature
S'Klallam	Stream Temperature Monitoring Program	Camp Discovery	Camp Discovery	Yes				1159452.444	301665.9155				Temperature
USGS	Groundwater Quality Monitoring Program	25N/01W-04K01	25N/01W-04K01	Yes				1153686	255948				Chloride
USGS	Groundwater Quality Monitoring Program	26N/01W-07K01	26N/01W-07K01	Yes				1143856	283063				Chloride
USGS	Groundwater Quality Monitoring Program	26N/01W-18M01	26N/01W-18M01	Yes				1141928	277336				Chloride
USGS	Groundwater Quality Monitoring Program	26N/01W-29R01	26N/01W-29R01	Yes				1150570	265151				Chloride
USGS	Groundwater Quality Monitoring Program	26N/02W-13G01	26N/02W-13G01	Yes				1138557	279148				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01E-04E01	27N/01E-04E01	Yes				1152279	320752				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01E-05A01	27N/01E-05A01	Yes				1182072	320107				Chloride

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
USGS	Groundwater Quality Monitoring Program	27N/01E-16E01	27N/01E-16E01	Yes				1184734	308893				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01W-18D02	27N/01W-18D02	Yes				1142302	312295				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01W-18K01	27N/01W-18K01	Yes				1144328	308897				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01W-18P01	27N/01W-18P01	Yes				1144110	308396				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01W-18Q01	27N/01W-18Q01	Yes				1144635	307571				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01W-19K01	27N/01W-19K01	Yes				1145143	303504				Chloride
USGS	Groundwater Quality Monitoring Program	27N/01W-36B01	27N/01W-36B01	Yes				1170335	295259				Chloride
USGS	Groundwater Quality Monitoring Program	27N/02W-22Q02	27N/02W-22Q02	Yes				1129267	302203				Chloride
USGS	Groundwater Quality Monitoring Program	27N/02W-22R01	27N/02W-22R01	Yes				1130659	303179				Chloride
USGS	Groundwater Quality Monitoring Program	27N/02W-24C01	27N/02W-24C01	Yes				1138627	307527				Chloride
USGS	Groundwater Quality Monitoring Program	27N/02W-24C02	27N/02W-24C02	Yes				1147966	304444				Chloride
USGS	Groundwater Quality Monitoring Program	27N/02W-24H01	27N/02W-24H01	Yes				1140278	305456				Chloride
USGS	Groundwater Quality Monitoring Program	27N/02W-27B01	27N/02W-27B01	Yes				1128912	301706				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-15J01	28N/01E-15J01	Yes				1193651	339593				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-16M01	28N/01E-16M01	Yes				1184470	340319				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-16P01	28N/01E-16P01	Yes				1186476	338751				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-16Q01	28N/01E-16Q01	Yes				1189212	339192				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-16Q02	28N/01E-16Q02	Yes				1188860	338694				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-22B01	28N/01E-22B01	Yes				1179952	322692				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-22G01	28N/01E-22G01	Yes				1192521	335059				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-33M02	28N/01E-33M02	Yes				1185088	323581				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-33N01	28N/01E-33N01	Yes				1184723	322576				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-33P01	28N/01E-33P01	Yes				1175867	309109				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-34P01	28N/01E-34P01	Yes				1190846	321923				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-35A01	28N/01E-35A01	Yes				1199120	325782				Nitrate, Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-35A03	28N/01E-35A03	Yes				1199144	326795				Chloride
USGS	Groundwater Quality Monitoring Program	28N/01E-35A04	28N/01E-35A04	Yes				1199132	326289				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-04G01	29N/01E-04G01	Yes				1188918	383795				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-04L01	29N/01E-04L01	Yes				1187171	381810				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-05H01	29N/01E-05H01	Yes				1185497	382864				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-05H02	29N/01E-05H02	Yes				1185169	383379				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-06M01	29N/01E-06M01	Yes				1175620	382092				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-07D01	29N/01E-07D01	Yes				1175910	380057				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-07E01	29N/01E-07E01	Yes				1175533	378546				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-07M03	29N/01E-07M03	Yes				1175508	377533				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-08J01	29N/01E-08J01	Yes				1184671	376803				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-09J01	29N/01E-09J01	Yes				1190108	376672				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-28P01	29N/01E-28P01	Yes				1186623	359018				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-33E01	29N/01E-33E01	Yes				1186222	356494				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01E-33M01	29N/01E-33M01	Yes				1185658	355697				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01W-01Q01	29N/01W-01Q01	Yes				1173204	380631				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01W-08B01	29N/01W-08B01	Yes				1152119	380355				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01W-18E01	29N/01W-18E01	Yes				1143799	374288				Chloride
USGS	Groundwater Quality Monitoring Program	29N/01W-22R01	29N/01W-22R01	Yes				1163037	365783				Chloride
USGS	Groundwater Quality Monitoring Program	29N/02W-07C03	29N/02W-07C03	Yes				1113410	382210				Chloride
USGS	Groundwater Quality Monitoring Program	29N/02W-13P01	29N/02W-13P01	Yes				1139781	371556				Chloride
USGS	Groundwater Quality Monitoring Program	29N/02W-23J01	29N/02W-23J01	Yes				1136826	367885				Chloride
USGS	Groundwater Quality Monitoring Program	29N/02W-24H01	29N/02W-24H01	Yes				1142972	368735				Chloride
USGS	Groundwater Quality Monitoring Program	29N/02W-24N01	29N/02W-24N01	Yes				1138159	366836				Chloride
USGS	Groundwater Quality Monitoring Program	29N/03W-01J01	29N/03W-01J01	Yes				1110634	385025				Chloride
USGS	Groundwater Quality Monitoring Program	29N/03W-02K01	29N/03W-02K01	Yes				1104635	384485				Chloride
USGS	Groundwater Quality Monitoring Program	29N/03W-12A01	29N/03W-12A01	Yes				1102872	370344				Chloride
USGS	Groundwater Quality Monitoring Program	29N/03W-12D01	29N/03W-12D01	Yes				1107748	381559				Chloride
USGS	Groundwater Quality Monitoring Program	29N/03W-12F02	29N/03W-12F02	Yes				1107807	381253				Chloride
USGS	Groundwater Quality Monitoring Program	29N/03W-12G01	29N/03W-12G01	Yes				1110296	380270				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-20P01	30N/01E-20P01	Yes				1182784	397121				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-28E01	30N/01E-28E01	Yes				1186397	394803				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-28L01	30N/01E-28L01	Yes				1187563	392444				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-28L02	30N/01E-28L02	Yes				1187369	392854				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-29A01	30N/01E-29A01	Yes				1186130	395012				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-29C01	30N/01E-29C01	Yes				1183346	395080				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-29K01	30N/01E-29K01	Yes				1184378	392825				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-32A01	30N/01E-32A01	Yes				1185316	389457				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-32B01	30N/01E-32B01	Yes				1183970	389996				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-32G01	30N/01E-32G01	Yes				1183266	389000				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-33C01	30N/01E-33C01	Yes				1187718	390413				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01E-33E01	30N/01E-33E01	Yes				1186323	388926				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-16K01	30N/01W-16K01	Yes				1157155	404350				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-16K02	30N/01W-16K02	Yes				1157834	404333				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-16R01	30N/01W-16R01	Yes				1159152	402778				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-22K01	30N/01W-22K01	Yes				1162782	398631				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-22P01	30N/01W-22P01	Yes				1162213	397632				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-29E01	30N/01W-29E01	Yes				1149713	395014				Chloride
USGS	Groundwater Quality Monitoring Program	30N/01W-32J01	30N/01W-32J01	Yes				1153342	388230				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-12Q01	30N/02W-12Q01	Yes				1142045	408191				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-12Q02	30N/02W-12Q02	Yes				1141654	408810				Chloride

Stations

Organization	Program	Station ID	Station Name	Active Monitoring?	Period of Record	Latitude	Longitude	WSP X Coordinate	WSP83 Y Coordinate	Data Frequency	Area (mi2)	Elevation (ft)	Parameters
USGS	Groundwater Quality Monitoring Program	30N/02W-13J01	30N/02W-13J01	Yes				1143229	404206				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-15L01	30N/02W-15L01	Yes				1130688	405049				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-16G01	30N/02W-16G01	Yes				1126319	406688				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-24G01	30N/02W-24G01	Yes				1141073	399702				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-24M01S	30N/02W-24M01S	Yes				1139376	399747				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-27M01	30N/02W-27M01	Yes				1128640	394664				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-27P01	30N/02W-27P01	Yes				1129354	393428				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-28J01	30N/02W-28J01	Yes				1127670	393980				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-28L01	30N/02W-28L01	Yes				1124629	394570				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-28N03	30N/02W-28N03	Yes				1122889	393098				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-31J02	30N/02W-31J02	Yes				1117019	389712				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-33G01	30N/02W-33G01	Yes				1126569	390969				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-33H01	30N/02W-33H01	Yes				1127927	390932				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-34C01	30N/02W-34C01	Yes				1130345	392387				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-34H01	30N/02W-34H01	Yes				1132993	389781				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-34H02	30N/02W-34H02	Yes				1132654	389791				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-34L01	30N/02W-34L01	Yes				1129926	389459				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-35E01	30N/02W-35E01	Yes				1134691	389736				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-35F01	30N/02W-35F01	Yes				1135384	390224				Chloride
USGS	Groundwater Quality Monitoring Program	30N/02W-36P01	30N/02W-36P01	Yes				1140557	387957				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-22K01	30N/03W-22K01	Yes				1099548	401459				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-23H01	30N/03W-23H01	Yes				1106220	401977				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-23H03	30N/03W-23H03	Yes				1105889	402291				Nitrate, Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-25C01	30N/03W-25C01	Yes				1108758	398053				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-27B02	30N/03W-27B02	Yes				1099517	398013				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-27B03	30N/03W-27B03	Yes				1099579	397808				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-27B04	30N/03W-27B04	Yes				1098900	397828				Nitrate, Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-27Q01	30N/03W-27Q01	Yes				1099324	393659				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-33P01	30N/03W-33P01	Yes				1092525	388889				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-34H01	30N/03W-34H01	Yes				1100437	392208				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-35E01	30N/03W-35E01	Yes				1101486	390860				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-36F01	30N/03W-36F01	Yes				1108241	391783				Chloride
USGS	Groundwater Quality Monitoring Program	30N/03W-36L01	30N/03W-36L01	Yes				1109208	389931				Nitrate, Chloride
USGS	National Streamflow Information Program; NWISWeb Data	12050500	Snow Creek near Maynard	N	1953 - 1979; 1952-1972	47 56' 25" N	122 53'10" W			Peak and Daily Flow	11.2	220	Flow
USGS	National Streamflow Information Program; NWISWeb Data	12051500	Chimacum Creek nr Chimacum	N	1952-1957; 1973	47 58' 27" N	122 46' 35" W			Monthly and Peak Flow	13.8	140	Flow; Biological, Nutrients, Major Inorganics, Physical
USGS	National Streamflow Information Program; NWISWeb Data	12052210	Big Quilcene River below Diversion	N	1971 - 1972; 1993 - 1999	47 47' 05" N	122 58' 42" W			Daily and Peak Flow	49.4	1009	Flow
USGS	National Streamflow Information Program; NWISWeb Data	12052500	Big Quilcene River nr Quilcene	N	1951, 1971-1972; 1959 - 1974	47 48' 39" N	122 54' 34" W			Daily Flow; Monthly	66.4	101.12	Flow; Biological, Nutrients, Major Inorganics, Physical
USGS	National Streamflow Information Program; NWISWeb Data	12052000	Little Quilcene nr Quilcene	N	1926 - 1957	47 50' 15" N	122 53' 10" W			Daily and Peak Flow	23.7	95	Flow
USGS	National Streamflow Information Program; NWISWeb Data	12052400	Penny Creek	N	1986 - 1987	47 48' 40" N	122 54' 50" W			Peak Flow	6.78		Flow
Citizen WQ	Leland Citizens Water Quality Testing	LC3		Yes						Monthly			
Citizen WQ	Leland Citizens Water Quality Testing	LL4		Yes						Monthly			
Citizen WQ	Leland Citizens Water Quality Testing	LL5		Yes						Monthly			
Citizen WQ	Leland Citizens Water Quality Testing	LL6		Yes						Monthly			
Citizen WQ	Leland Citizens Water Quality Testing	LC2		Yes						Monthly			
Citizen WQ	Leland Citizens Water Quality Testing	LC1		Yes						Monthly			

TABLE 9
Recommended and Current Monitoring

Waterbody	Current Sampling Locations			Proposed Sampling Locations			Proposed Changes	
	High Priority	Medium Priority	Low Priority	High Priority	Medium Priority	Low Priority	Add Parameter to Existing gauges:	Add New Gauges:
Andrews Creek	Continuous Temperature			DO, pH	Fecal Coliform		Ecology	
				TSS/Turbidity			Ecology	
Barnhouse Creek	Continuous Temperature			DO, pH, Temperature	Fecal Coliform		Jefferson County	
				Nitrogen/Phosphorus	TSS/Turbidity		Jefferson County	
Big Quilcene River	Continuous Temperature							
	DO/pH/Temperature							
	Fecal Coliform							
	Flow							
	Nitrogen/Phosphorus							
	TSS/Turbidity							
Contractors Creek				Continuous Temperature	Fecal Coliform	Nitrogen/Phosphorus		Yes
					DO, pH, Temperature			Yes
					TSS/Turbidity			Yes
Coyle Creek*								
Chimacum Creek	Continuous Temperature							
	DO,pH,Temperature							
	Fecal Coliform							
	Flow							
	Nitrogen/Phosphorus							
	TSS/Turbidity							
Donovan Creek	Continuous Temperature	Nitrogen/Phosphorus						
	DO,pH,Temperature							
	Fecal Coliform							
	TSS/Turbidity							
Eagle Creek					Continuous Temperature	Fecal Coliform		Yes
					DO,pH,Temperature	Nitrogen/Phosphorus		Yes
					TSS/Turbidity			Yes
East Chimacum Creek	Continuous Temperature							
	DO,pH,Temperature							
	Fecal Coliform							
	Nitrogen/Phosphorus							
	TSS/Turbidity							
Houck Creek				TSS/Turbidity	DO,pH,Temperature			Yes
					Fecal Coliform			Yes
					Nitrogen/Phosphorus			Yes
Howe Creek				TSS/Turbidity	DO,pH,Temperature	Fecal Coliform		Yes
						Nitrogen/Phosphorus		Yes
Indian George Creek				TSS/Turbidity	Fecal Coliform			Yes
					DO,pH,Temperature			Yes
					Continuous Temperature			Yes
					Nitrogen/Phosphorus			Yes
Jackson Creek				Fecal Coliform			S'Klallam	
Jakeway Creek	Continuous Temperature			TSS/Turbidity	Fecal Coliform		Jefferson County	
				DO, pH, Temperature	Nitrogen/Phosphorus		Jefferson County	
Johnson Creek				Fecal Coliform				Yes-303(d) list
Jimmycomelately Creek	Continuous Temperature			Fecal Coliform			Ecology	
	Flow			TSS/Turbidity			Ecology	
				DO/pH			Ecology	
				Nitrogen/Phosphorus			Ecology	
Little Quilcene River	Continuous Temperature			Fecal Coliform (upstream)			Port Townsend	
	Flow							
	Fecal Coliform (downstream)							
	TSS/Turbidity							
	DO, pH, Temperature							
	Nitrogen/Phosphorus							
Leland Creek	Continuous Temperature	Fecal Coliform						
	TSS/Turbidity	Nitrogen/Phosphorus						
	DO,pH,Temperature							
Ludlow Creek	TSS/Turbidity	Continuous Temperature			Nitrogen/Phosphorus		Ludlow Citizens	
	Fecal Coliform							
	DO, pH, Temperature							
Marple Creek				TSS/Turbidity	DO,pH,Temperature		S'Klallam	
					Fecal Coliform		S'Klallam	
					Nitrogen/Phosphorus		S'Klallam	
Naylors Creek	Continuous Temperature							
	TSS/Turbidity							
	DO,pH,Temperature							
	Fecal Coliform							
	Nitrogen/Phosphorus							
Put aansuu Creek*								
Penny Creek		Continuous Temperature		TSS/Turbidity	DO,pH,Temperature		S'Klallam	
					Fecal Coliform		S'Klallam	
					Nitrogen/Phosphorus		S'Klallam	
Ripley Creek		Continuous Temperature		TSS/Turbidity	DO,pH,Temperature	Fecal Coliform	S'Klallam (at confluence)	Yes
						Nitrogen/Phosphorus	S'Klallam (at confluence)	Yes
Salmon Creek	Continuous Temperature		Nitrogen/Phosphorus					
	DO,pH,Temperature							
	Fecal Coliform							
	Flow							
	Nitrogen/Phosphorus							
	TSS/Turbidity							
Shine Creek	Continuous Temperature			DO,pH	Flow		S'Klallam	
				Fecal Coliform	Nitrogen/Phosphorus		S'Klallam	
				TSS/Turbidity			S'Klallam	
Snow Creek	Continuous Temperature							
	DO,pH,Temperature							
	Fecal Coliform							
	Flow							
	Nitrogen/Phosphorus							
	TSS/Turbidity							
Spencer Creek				TSS/Turbidity	DO,pH,Temperature		S'Klallam	
					Fecal Coliform		S'Klallam	
					Nitrogen/Phosphorus		S'Klallam	
Tarboo Creek	Continuous Temperature							
	DO,pH,Temperature							
	Fecal Coliform							
	Flow							
	Nitrogen/Phosphorus							
	TSS/Turbidity							
Thorndyke Creek	Continuous Temperature	Fecal Coliform						
	DO, pH, Temperature	Nitrogen/Phosphorus						
	Flow							
	TSS/Turbidity							
Townsend Creek				TSS/Turbidity	Continuous Temperature	Fecal Coliform		Yes
					DO, pH, Temperature	Nitrogen/Phosphorus		Yes
Trapper Creek				TSS/Turbidity	Continuous Temperature	Fecal Coliform		Yes
					DO, pH, Temperature	Nitrogen/Phosphorus		Yes
Tunnel Creek				TSS/Turbidity*	Continuous Temperature**	Fecal Coliform		Yes**
					DO, pH, Temperature**			Yes**

*Location Unknown and Current Monitoring Unknown
**These parameters are monitored at the confluence of Big Quilcene River and Tunnel Creek by Port Townsend; this may be sufficient to meet needs.
DO = Dissolved oxygen
TSS = Total suspended solids
Nitrogen/Phosphorus = Nitrate as N and total phosphorus as P. In areas with agricultural influences, ammonia as N analysis may be warranted.

APPENDIX A

WATER QUALITY REGULATORY STANDARDS

Water Quality Standards - Surface Waters,
From WAC 173-201A-030

Parameter/water class	Class AA		Class A		Class B		Class C		Lake
	fresh	marine	fresh	marine	fresh	marine	fresh	marine	
Fecal Coliform	<50/100 mL	<14/100 mL	<100/100 mL	<14/100 mL	<200/100 mL	<100/100 mL	<200/100 mL	<200/100 mL	<50/100 mL
Dissolved Oxygen	>9.5 mg/L	>7.0 mg/L	>8.0 mg/L	>6.0 mg/L	>6.5 mg/L	>5.0 mg/L	>4.0 mg/L	>4.0 mg/L	**
Total Dissolved Gas	<110%	<110%	<110%	<110%	<110%	<110%	no standard	no standard	<110%
Temperature	<16 C	<16 C	<18 C	<16 C	<21 C	<19 C	<22 C	<22 C	**
pH	6.5 - 8.5	7.0 - 8.5	6.5 - 8.5	7.0 - 8.5	6.5 - 8.5	7.0 - 8.5	6.5 - 9.0	6.5 - 9.0	**
Turbidity	<5 NTU	<5 NTU	<5 NTU	<5 NTU	<10 NTU	<10 NTU	<10 NTU	<10 NTU	<5 NTU
Toxics	*	*	*	*	*	*	*	*	*
Aesthetics	not impaired	not impaired	not impaired	not impaired	not impaired	not impaired	not impaired	not impaired	not impaired

*Toxics shall be below a level that causes an adverse reaction (see WAC 173-201A-040 and 173-201A-050)

**No measurable decrease from natural conditions

Federal And State Drinking Water Quality Standards

Contaminant (units in mg/L unless	MCLG	Primary MCL	DOH	Major Sources in Drinking Water	Health Effects Language
Microbiology					
Heterotrophic plate count	n/a	TT	-	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment
<i>Legionella</i>	0	TT	-	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems
Total Coliforms (including fecal coliform and E. Coli)	0	0.05	-	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present ⁵	Coliforms are naturally present in the environment; as well as feces; fecal coliforms and <i>E. coli</i> only come from human and animal fecal waste.
Turbidity	n/a	TT	-	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff
Viruses (enteric)	0	TT	-	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste
Disinfection Byproducts					
Bromodichloromethane	0	0.08	-		
Bromoform	0	0.08	-		
Chloroform	0	0.08	-		
Chloromethane	-	-	-		
Dibromochloromethane	0	0.08	-		
Bromate	0	0.01	-	Increased risk of cancer	Byproduct of drinking water disinfection
Chlorite	0.8	1	-	Anemia; infants & young children: nervous system effects	Byproduct of drinking water disinfection
Haloacetic acids (HAA5)	n/a	0.06	-	Increased risk of cancer	Byproduct of drinking water disinfection
Total Trihalomethanes (TTHMs)	0	0.1 (0.08 effective 12/03)	0.1	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection
Disinfectants					
Chloramines (as Cl2)	MRDLG=4	MRDL=4.0	-	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes
Chlorine (as Cl2)	MRDLG=4	MRDL=4.0	-	Eye/nose irritation; stomach discomfort	Water additive used to control microbes
Chlorine dioxide (as ClO2)	MRDLG=0.8	MRDL=0.8	-	Anemia; infants & young children: nervous system effects	Water additive used to control microbes
Inorganic Chemicals					
Antimony	0.006	0.006	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	0	0.05 (0.01 effective 01/23/06)	0.05	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass & electronicsproduction wastes
Asbestos (fiber >10 micrometers)	7 MFL	7 MFL	7 MFL	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits
Barium	2	2	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium	0.004	0.004	-	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium	0.005	0.005	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (total)	0.1	0.1	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits
Copper	1.3	TT, Action Level = 1.3	-	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage. Long term exposure: Liver or kidney damage	Corrosion of household plumbing systems; erosion of natural deposits
Cyanide (as free cyanide)	0.2	0.2	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride	4	4	4	Bone disease (pain and tenderness of the bones); Children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Lead	0	TT, Action Level = 0.015	-	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities. Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposit.
Mercury (inorganic)	0.002	0.002	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands

Federal And State Drinking Water Quality Standards

Contaminant (units in mg/L unless	MCLG	Primary MCL	DOH	Major Sources in Drinking Water	Health Effects Language
Nitrate (measured as Nitrogen)	10	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (measured as Nitrogen)	1	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	0.05	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines
Thallium	0.0005	0.002	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories
Organic Chemicals					
Acrylamide	0	TT	-	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment
Alachlor	0	0.002	-	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops
Atrazine	0.003	0.003	-	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops
Benzene	0	0.005	-	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills
Benzo(a)pyrene (PAHs)	0	0.0002	-	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines
Carbofuran	0.04	0.04	-	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa
Carbon tetrachloride	0	0.005	-	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities
Chlordane	0	0.002	-	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide
Chlorobenzene	0.1	0.1	-	Liver or kidney problems	Discharge from chemical and agricultural chemical factories
2,4-D	0.07	0.07	-	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops
Dalapon	0.2	0.2	-	Minor kidney changes	Runoff from herbicide used on rights of way
1,2-Dibromo-3-chloropropane (DBCP)	0	0.0002	-	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
o-Dichlorobenzene	0.6	0.6	-	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories
p-Dichlorobenzene	0.075	0.075	-	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories
1,2-Dichloroethane	0	0.005	-	Increased risk of cancer	Discharge from industrial chemical factories
1,1-Dichloroethylene	0.007	0.007	-	Liver problems	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	0.07	0.07	-	Liver problems	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	0.1	0.1	-	Liver problems	Discharge from industrial chemical factories
Dichloromethane	0	0.005	-	Liver problems; increased risk of cancer	Discharge from drug and chemical factories
1,2-Dichloropropane	0	0.005	-	Increased risk of cancer	Discharge from industrial chemical factories
Di(2-ethylhexyl) adipate	0.4	0.4	-	Weight loss, liver problems, or possible reproductive difficulties.	Discharge from chemical factories
Di(2-ethylhexyl) phthalate	0	0.006	-	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories
Dinoseb	0.007	0.007	-	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables
Dioxin (2,3,7,8-TCDD)	0	3.0E-08	-	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories
Diquat	0.02	0.02	-	Cataracts	Runoff from herbicide use
Endothall	0.1	0.1	-	Stomach and intestinal problems	Runoff from herbicide use
Endrin	0.002	0.002	-	Liver problems	Residue of banned insecticide
Epichlorohydrin	0	TT	-	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals
Ethylbenzene	0.7	0.7	-	Liver or kidneys problems	Discharge from petroleum refineries
Ethylene dibromide	0	0.00005	-	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries
Glyphosate	0.7	0.7	-	Kidney problems; reproductive difficulties	Runoff from herbicide use
Heptachlor	0	0.0004	-	Liver damage; increased risk of cancer	Residue of banned termiticide
Heptachlor epoxide	0	0.0002	-	Liver damage; increased risk of cancer	Breakdown of heptachlor
Hexachlorobenzene	0	0.001	-	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene	0.05	0.05	-	Kidney or stomach problems	Discharge from chemical factories
Lindane	0.0002	0.0002	-	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	0.04	0.04	-	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl (Vydate)	0.2	0.2	-	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes
Polychlorinated biphenyls (PCBs)	0	0.0005	-	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals

Federal And State Drinking Water Quality Standards

Contaminant (units in mg/L unless	MCLG	Primary MCL	DOH	Major Sources in Drinking Water	Health Effects Language
Pentachlorophenol	0	0.001	-	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories
Picloram	0.5	0.5	-	Liver problems	Herbicide runoff
Simazine	0.004	0.004	-	Problems with blood	Herbicide runoff
Styrene	0.1	0.1	-	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene	0	0.005	-	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners
Toluene	1	1	-	Nervous system, kidney, or liver problems	Discharge from petroleum factories
Toxaphene	0	0.003	-	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle
2,4,5-TP (Silvex)	0.05	0.05	-	Liver problems	Residue of banned herbicide
1,2,4-Trichlorobenzene	0.07	0.07	-	Changes in adrenal glands	Discharge from textile finishing factories
1,1,1-Trichloroethane	0.2	0.2	-	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	0.003	0.005	-	Liver, kidney, or immune system problems	Discharge from industrial chemical factories
Trichloroethylene	0	0.005	-	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories
Vinyl chloride	0	0.002	-	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories
Xylenes (total)	10	10	-	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories

Definitions:

SDWA- Safe Drinking Water Act

DOH- Washington Department of Health

DOE- Washington Department of Ecology

Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Treatment Technique (TT) - A required process intended to reduce the level of a contaminant in drinking water.

Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million.

EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

-A13A15Cryptosporidium (as of1/1/02 for systems serving >10,000 and 1/14/05 for systems serving <10,000) 99% removal.

-Giardia lamblia: 99.9% removal/inactivation

-Viruses: 99.99% removal/inactivation

-Legionella: No limit, but EPA believes that if Giardia and viruses are removed/inactivated, Legionella will also be controlled.

-Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelometric turbidity units (NTU); systems that filter must ensure that the turbidity go no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples in any month. As of January 1, 2002, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.

-HPC: No more than 500 bacterial colonies per milliliter.

-Long Term 1 Enhanced Surface Water Treatment (Effective Date: January 14, 2005); Surface water systems or (GWUDI) systems serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, Cryptosporidium removal requirements, updated watershed control requirements for unfiltered systems).

Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Disease-causing microbes (pathogens) in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. These pathogens may pose a special health risk for infants, young children, and people with severely compromised immune systems.

Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L). Chloroform is regulated with this group but has no MCLG.

Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L). Monochloroacetic acid, bromoacetic acid, and dibromoacetic acid are regulated with this group but have no MCLGs.

Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

Each water system must certify, in writing, to the state (using third-party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows:

-Acrylamide = 0.05% dosed at 1 mg/L (or equivalent)

-Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent)

Federal and State Secondary Maximum Contaminant Levels

Constituent	Secondary Maximum Contaminant Levels	
	EPA (mg/L)	DOH (mg/L)
Aluminum	0.05 to 0.2	-
Chloride	250	250
Color	15 (color units)	-
Copper	1	-
Corrosivity	noncorrosive	-
Fluoride	2	2
Foaming Agents	0.5	-
Iron	0.3	0.3
Manganese	0.05	0.05
Odor	3 threshold odor number	-
pH	6.5 to 8.5	-
Silver	0.1	0.1
Sulfate	250	250
Total Dissolved Solids	500	-
Zinc	5	5

Note:

-- = No Secondary Maximum Contaminant Level

All units are in mg/L except where noted.

DOH- Washington Department of Health

DOE- Washington Department of Ecology

EPA- United States Environmental Protection Agency

APPENDIX B

SAMPLE COLLECTION PROTOCOL (SURFACE WATER)

1. SAMPLE COLLECTION PROTOCOL

The Standard Methods for the Examination of Water and Wastewater, 20th Edition (American Health Association 1998) provides standard sampling protocol for all major pollutants or water quality indicators. This manual provides methodology for sample collection, handling, storage, shipping, and analysis. The procedures outlined in this manual are the recommended procedures for surface water, groundwater, and marine water sampling.

The Washington State Department of Ecology has developed their own standard stream sampling protocols for Ecology stream sampling programs. The complete protocol listing can be found at <http://www.ecy.wa.gov/pubs/0103036.pdf>. The Ecology protocols were developed for their stream monitoring program, and as such are specific to their needs and requirements. These protocols are presented here as a guide for planning sample collection programs, and are not required procedures.

1.1 Sample Preservation and Shipment

After collection, samples need to be placed in a cooler containing enough ice to keep them cool (below 4°C) until all samples are collected. The short holding times for the bacteria and orthophosphate samples make timely deliveries imperative.

Table B-1 presents the holding times, recommended sample bottles, recommended preservatives, and sample storage temperatures recommended by Ecology.

1.2 Protocols per Parameter

The protocol for collection of data for selected parameters is provided in this section.

1.2.1 Conductivity

Conductivity is measured with a meter, and measures the ability of a water sample to carry an electrical current. It is dependent upon the concentration and type of dissolved ions, and water temperature. Conductivity meters typically standardize the measurement to 25°C (i.e. specific conductivity) for data comparison.

Equipment

- Conductivity meter and probe
- Deionized water
- 99-109 µmhos/cm NIST Traceable Calibration Standard
- Plastic sample container
- Deionized water squirt bottle
- pH/Conductivity log form

Calibration

Soak the conductivity probe in deionized or tap water for at least 30 minutes. Replace the conductivity standard. Make sure that the meter is set to read in the non-linear function (nLF) mode for temperature compensation and the reference temperature for the meter is set at 25°C. Follow the instrument manual to adjust the cell constant.

Rinse the conductivity sample cup and conductivity probe with deionized water or sample water. Then agitate the water in the DO sample bucket and over fill the sample cup. Turn the meter "ON" and let the meter equilibrate.

1.2.2 Dissolved Oxygen

Dissolved oxygen (DO) is the amount of oxygen dissolved in a water sample. The amount varies directly in response to changes in atmospheric pressure and water temperature. The higher the atmospheric pressure the higher the oxygen solubility in water and the higher the DO concentration. The opposite is true with temperature, the higher the temperature the lower the solubility and saturation concentration of oxygen in water. DO is one of the major factors that determine the type of biological communities that inhabit an aquatic system. The addition of organic or inorganic material that exerts an oxygen demand through respiration and biodegradation lowers the DO concentration and can facilitate the growth of nuisance organisms.

Equipment

- DO box
- BOD bottles, 300 mL
- Sampling bucket
- Plastic BOD bottle water seal caps
- Manganous sulfate solution
- Alkali-iodate-azide reagent
- 2 mL pipettes
- Deionized water squirt bottle
- Deionized water
- 10% HCl

Cleaning

The DO sample bucket and BOD bottles are rinsed with deionized water after each run. BOD bottles are stored upside down in the DO box to keep dust out and promote drying. The sample bucket is stored with at least 3 cm of deionized water standing in the bottom of the bucket. This is a slight modification of azide modification method presented in the 20th edition of Standard Methods, which calls for the addition of 1 mL of manganous sulfate and azide instead of 2 mL. The excess reagents are accounted for by using 203mL volumetric flasks rather than 201mL flasks.

Field Preparation

Rinse the sampling bucket, top, and filler tubes with deionized water. Place the BOD bottle into the sampling bucket. Orient the top of the sampling bucket to insure that a filler tube is inserted into the BOD bottle and fitted into place

The water sample should be taken from the main part of the channel where possible. Lower the sample bucket to the water surface. Then lower the bucket rapidly into the water until it has completely submerged to minimize sampling of surface film. Retrieve the bucket when the bubbles

from the vent tube stop (bucket is full). A swift current may take the bucket downstream before it completely fills. If so, pull the bucket from the water, allow it to swing upstream, and then drop it back into the water. This step may need to be repeated a few times until the bucket fills. Retrieve the filled bucket, taking care to not dislodge bridge debris into it.

Carefully remove the top from the sampling bucket and remove the BOD bottle. Try to avoid contamination of the water remaining in the sampler. If necessary, tap the side of the BOD bottle to dislodge any air bubbles clinging inside. Insert a glass stopper in the bottle and carefully discard the displaced water. Remove the stopper and fix the sample by adding approximately two milliliters of manganous sulfate solution followed by two milliliters of alkaline-azide solution using the disposable pipettes reserved for each solution. Add these reagents by immersing the tip of the pipette in the water before injecting them into the solution (avoids splashing and entraining air bubbles in the reagent stream). Replace the stopper and mix the contents by inverting the bottle a few times. Add a few milliliters of deionized water around the stopper to form a water seal and cover the bottle top with a plastic cap. Place the fixed DO sample in the sample box.

1.2.3 Fecal Coliform and Enterococci Bacteria

There are many potential disease-causing microorganisms that remain viable in freshwater. It is impractical, both with respect to time and money to test ambient water samples individually for the presence of all potential vectors. The practical approach is to test the water samples for the presence of indicator organisms. Fecal coliform bacteria concentration is currently used as the preferred indicator organism in Washington State. However, enterococci are being proposed as a replacement indicator. Fecal coliform and enterococci bacteria are present within the intestinal tract of warm-blooded animals and remain viable in freshwater for a variable period of time.

- 250 mL autoclaved bacteria sample bottles
- Fecal coliform sampler

Sample Collection

Care should be used at all times to avoid contamination of the inside of the sample bottle, or the foil covered silicon stopper or bottle cap. Also, the sample needs to be placed in ice in a cooler as soon as possible after collection. Fit the bacteria sample bottle into the fecal coliform sampler. Remove the aluminum foil cover stopper and place it where contamination can be avoided. Lower the sampler in the stream (mid-channel) to water surface, taking care to not dislodge debris into the bottle. When the sampler touches the water allow the fin orient it in the current with the bottle upstream. Then lower the bottle rapidly into the water until it has completely submerged to minimize sampling of surface film. Retrieve the filled bottle taking care to not dislodge bridge debris into it. Before the foil-covered cap is replaced, pour out a little of the sample to establish the water level at the bottle shoulder.

No field processing is required. Label the sample bottle with the appropriate tag and place it in ice in a cooler.

1.2.4 Metals

Equipment

- Stainless steel metals sampler
- Rope

- 500ml Teflon bottles
- Small Teflon vials containing 5 ml Concentrated Nitric Acid
- 125 ml narrow mouth poly bottle containing H₂SO₄ preservative (hardness sample bottle)
- Disposable 0.45 micron cellulose nitrate filter unit (precleaned Nalgene #450-0045, type S)
- Hand pump for filter unit

Sample Collection

Water samples are collected as single grabs using the stainless steel metals sampler and a 500ml Teflon bottle. Care must be used at all times to avoid contaminating the inside of the sample bottle with debris or ambient air. Also, samples need to be placed in ice in a cooler as soon as possible after collection.

The sample collection procedures are as follows:

- Invert the Teflon bottle sample bottle, remove the cap, and let the deionized water empty out of the bottle.
- Replace the cap, as soon as the bottle has emptied, to minimize ambient air contamination.
- Fit the sample bottle into the stainless steel metals sampler.
- Completely loosen the lid and attach the sampler lid clamp while keeping the lid on the bottle.
- Remove the lid from the attached hardness sample collection container.
- Lower the sampler in the stream (mid-channel) to the water surface, taking care to not dislodge debris into the bottle or the attached hardness sample container.
- Allow the sampler to orient itself in the current with the metals sample bottle upstream. Then lower the sampler rapidly into the water until it has completely submerged to minimize sampling of surface film. *Note: At about 25 cm under the water surface, the sampler should automatically raise the bottle lid and allow the bottle to fill.*
- Retrieve the filled bottle taking care to not dislodge debris.
- Loosen the sampler lid clamp while keeping the lid on the bottle and tighten the bottle cap.
- Cap and remove the filled sample bottle from the sampler, place it in a ziploc, and repeat steps 1-8 to obtain a second metals sample.
- Cap the second metals sample.
- Pour approximately 100 mL of the sample collected in the attached hardness sample collection container into a 125 mL hardness sample bottle. Cap and agitate the hardness sample bottle to insure that the acid gets mixed into the sample. *Note: Avoid contact with the acid.*

- Rinse the hardness sample collection container attached to the metals sampler with deionized water and recap it.

Field Processing - Dissolved Metals

- Remove the disposable filter unit from its ziploc bag.
- Attach the hand pump hose to the filter unit.
- Loosen the tape on one side of the top of the filter unit.
- Remove the cap from one of the filled sample bottles and empty the contents into the filter unit. *Note: Avoid touching or contaminating the inside of the filter unit.*
- Cap the used sample bottle and set it aside.
- Draw a vacuum on the filter unit by squeezing the hand pump.
- Filter as much of the sample as possible (at least half).
- Empty the deionized water from an unused Teflon bottle and place the cap over the opening.
- Remove the bottom of the filter apparatus containing the filtered sample, remove the cap from the top of the unused sample bottle (do not set the cap down) and fill the bottle with the filtered sample.
- Carefully add the nitric acid from a Teflon vial to the sample and screw the cap on tight.
- Label the sample with the appropriate Dissolved Metals sample tag and place it into its original ziploc bag along with the empty (capped) Teflon vial.
- Then put the bagged filtered sample along with the empty Teflon bottle into the larger Ziploc bag that contained the filter unit.

1.2.5 Total Recoverable and Total Mercury

- Remove the cap from the second sample bottle (do not set the cap down)
- If necessary, gently squeeze the side of the sample to liberate about 5 ml of sample to make room for the Nitric acid.
- Carefully add the Nitric acid from a Teflon vial to the sample and screw the cap on tight.

1.2.6 Nutrients

Nitrogen and phosphorus are the nutrients that most often limit aquatic algae growth in freshwater. When phosphorus is limiting, an increase in concentration can result in increased algal production, which can have aesthetic and ecological impacts. The typical phosphorus concentration of many of Washington's rivers and streams is very low, often less than 0.01 mg/L, which makes them especially susceptible to increases in phosphorus input.

Equipment

- Stainless steel DO sample bucket
- One 1-L poly bottle
- Rope
- Peristaltic pump
- Tubing (silicon)
- Filter apparatus (stand, polyethylene mesh support screen, under- and over-drain support,
- O-ring, wing nuts)
- Filters, cellulose acetate 0.45 μm pore size
- Deionized water squirt bottle
- Bottles, 125mL, brown poly (w/o preservative)
- Bottles, 125mL, clear poly (w/H₂SO₄ preservative)
- Deionized water
- 10% HCl
- Cleaning brush (toothbrush)

Cleaning

Contamination of the sampling equipment or sample bottles can result in an overestimate of phosphorus concentration. Cleanliness and standardized procedures are essential when collecting nutrient samples, particularly from oligotrophic streams. If soap is needed to clean the equipment, use "Liquinox". Other soaps usually contain trace amounts of phosphorus.

Acid-Washing of Nutrient Sample Collection Bottles

About 500 mL of 10% HCl is transferred from one 1-L poly nutrient sample bottle to the other. The acid-rinsed bottle is triple rinsed with deionized water and placed in the bottle holder attached to the DO sample bucket. The nutrient sample bottle containing the 10% HCl is shaken and set aside to soak. This process is repeated between each sampling event.

Filter Apparatus

The filter apparatus should be acid-washed before each run. Loosen the wing nuts and remove upper filter holder. Scrub the inside of both the upper and lower filter supports and the polyethylene screen with a brush. Then rinse the apparatus with deionized water, reassemble, and cycle 10% HCl solution through it (*Start by placing the tubing from the pump in the 1-L bottle containing the 500ml of HCl and set the bottle under the filter outlet. Turn the pump on. After about 30 seconds remove the hose from the acid and let the tubing purge itself of the remaining acid*). Then rinse the apparatus for 30 seconds with deionized water. Set up the apparatus for filtering (*Loosen the wing nuts and remove the top of the apparatus. Insert a 0.45 μm cellulose nitrate filter on the filter holder. Prevent leaking by making sure the O-ring is in place. Wet the new filter with deionized water and reassemble the filter apparatus*). Then turn on the filter pump and flush the apparatus with deionized water for 10-15 seconds).

Sample Collection and Processing

The nutrient samples are collected in the 1-L acid-washed bottle attached to the DO sample bucket.

Open a 125 mL preserved nutrient bottle (contains two milliliters of sulfuric acid) and set it in the sink bottle holder. Avoid contact with the acid. Agitate the 1-L nutrient sample and pour approximately 100 mL of the sample into the 125 mL bottle. Cap and agitate the 125 mL bottle to insure that the acid gets mixed into the sample. Turn on the filter pump and put the intake hose in the 1-L nutrient sample. Be sure the filtration apparatus has been rinsed with deionized water and has a new filter (See cleaning above). Allow the filtered sample water to run through the filter for 10-15 seconds to ensure that the deionized water has been purged from the apparatus. Then fill the bottle to the shoulder, and cap it. Remove the inlet hose from the 1-L nutrient sample bottle and the rinse hose exterior with deionized water. Next put the hose in the deionized water and allow the pump to flush the filter apparatus for 10-15 seconds.

Label the sample bottles with the appropriate sample tags and place them in the ice in a cooler.

1.2.7 pH

The pH of a water sample is defined as the negative logarithm of hydrogen ion activity. pH values range from 0 to 14, 0 being highly acidic, 14 being highly alkaline and 7 neutral. Each pH unit represents a tenfold change in the hydrogen ion activity. Natural waters usually fall within the pH range of 4 to 9, with Washington waters typically being from 6.5 to 8.5. The pH measurements made by the Freshwater Monitoring Unit are used in the calculation of ammonia toxicity and to determine if waters are in compliance with state pH standards.

Equipment

- pH meter
- pH probes (2)
- 1 M electrode filling solution (probe specific)
- Deionized water
- low ionic strength pH 4 buffer
- low ionic strength pH 6.97 buffer
- low ionic strength pH 9.27 buffer
- Plastic pipette
- Deionized water squirt bottle
- Sample container
- 10% HCl
- Meter Calibration Log Form (Appendix B)

Calibration

Remove the storage cap on the pH probe. Rinse off all salt deposits with deionized water. Replace the pH electrode filler solution in the probe using the plastic pipette. Refill the probe with the correct

(1 M KCl) reference solution. Soak the pH probe in tap water for at least thirty minutes before calibration. Replace the buffers. Follow instrument manual for a two-buffer calibration.

Re-calibrate the pH probe a second time after arriving at the first sample station to insure that it

has warmed up. If the meter fails to calibrate properly soak the probe for one minute in 10% HCl solution, then in deionized water. Recalibrate the meter. If calibration fails again, refer to the troubleshooting section.

Sample Measurement

Rinse the pH sample cup with deionized water or sample water. Then agitate the water in the DO sample bucket and over fill the sample cup. Place the pH probe in the sample, taking care to not submerge the probe fill hole. Turn the meter on and let it notify and hold on a stable reading (denoted by the word “ready” on the meter display and also signaled by an audible beep). Press the measure button and allow the meter to notify and hold on a stable reading a second time. *Note: A small amount of drift is normal. If the drift is >0.1, the first reading was probably premature.* Record the measurement on the Field Data Report Form to the nearest 0.01 pH units.

Quality Control

The calibration of the pH meter is checked against the 6.97 buffer three times a day: immediately after obtaining the first measurement of the day, at the midway point of a sampling day, and after the last station of the day. The process of checking the calibration is as follows: rinse the probe with deionized water, place it in the 6.97 buffer, and proceed as if the buffer were a typical water sample. If the pH is not within 0.1 of the true pH, then recalibrate the meter.

1.2.8 Stream Stage Height

Reference Point Measurement

A reference point is a fixed point or datum on the bridge or other structure from which a measurement can be made to the surface of the water under all flow conditions. The distance from this reference point to the water surface is measured with a weighted fiberglass measuring tape. The weighted tape is lowered to the water surface just to the point where the wake forms distinctive "V" behind the weight. The distance from the reference point to the water surface is recorded to the nearest 0.01 foot.

Wire Weight Gage

Measuring stage height with a wire weight gage is similar to using a reference point. A wire weight gage is a self-contained weighted measuring device that is permanently attached to the bridge. A wire weight gage is more accurate than the weighted fiberglass tape and the reference point for a wire weight gage is within the gage box itself. The first step is to move the check bar forward. Then drop the weight down until it touches the check bar, and record this number.

Next move the check bar back and lower the weight to the water surface to a point where the wake from the water passing by the weight forms a slight distinctive "V" shape. Record the measurement and retrieve the weight.

Staff Gage

A Staff Gage is a graduated measuring device securely fixed to a permanent structure in the streambed from which stage height can be read directly to the 0.01 foot.

Continuous Stage Height Recorder

Some of the continuous stage-height recorders, located by the ambient stations are operated by the USGS. Current stage height can be read from the metal tape in the gage house or, with some models, by pressing a button next to the LCD display.

1.2.9 Suspended Solids

Total suspended solids (TSS) refers to the material retained on a standard glass filter after filtration and heating to 103-105°C. TSS is a direct measurement of the concentration of suspended material present in a water sample.

Equipment

1-L poly bottle

Sample Collection

The water sample for TSS determination is collected in a 1-L poly bottle attached to the DO sample bucket. The water sample for TSS determination does not require any field processing. The sample bottle is tagged and placed in a cooler of ice.

1.2.10 Temperature

Temperature is a major factor that influences the metabolism and structure of the biological communities in rivers and streams. Stream temperature can be influenced by many factors including: discharge (flow), stream gradient, depth, stream cover, water color, time of day, season, stream segment, intensity of solar radiation, and human activities. Temperature is inversely related to dissolved oxygen levels. As temperature levels increase the solubility of oxygen decreases. This relationship become more important as temperatures rises. Metabolism of most species within an aquatic community increases with temperature resulting in a higher oxygen demand for respiration. Increased demand for oxygen combined with reduced availability can lead to displacement of all but the least sensitive species. Possibly just as important as the relationship between temperature and dissolved oxygen is the effect temperature can have on the toxicity of various pollutants.

Equipment

- Thermistor with attached probe (50 meter)
- Alcohol thermometer 1 - 50°C

Calibration

Check the calibration of the thermistor before departing on a run by placing the probe and the thermometer in a bottle of tap or deionized water. Allow at least two minutes for them to equilibrate. Also note the correction factor for the thermistor on the form.

Measurement

The thermistor probe is lowered at the stream sampling location (mid channel) to about .03 meters below the water surface. Turn the meter on and allow the probe to equilibrate. Record the temperature. *Note: Do not apply the correction factor prior to entering a result on the Field Data Report Form. The correction factor is applied when entering the result into the database.*

1.2.11 Turbidity

Turbidity is often thought of as a decrease in water clarity and is a measurement of the ability of the water sample to scatter or absorb light. Turbidity increases with the concentration of suspended matter in the water and the light refracting or light absorbing characteristics of the suspended material. The Nephelometric method for turbidity determination measures the amount of light scattered at an angle perpendicular to the light source. This method compares the light scattering ability of a water sample to known standards. The results are expressed in NTU (Nephelometric Turbidity Units).

Sample Collection

The water sample for turbidity determination is taken from a sub-sample of the water in the DO sample bucket. Gently agitate the sample water in the DO sample bucket and fill a 500 mL sample bottle to the bottle shoulder. Cap and tag the sample, and place it in ice in a cooler.

1.3 REFERENCES

Department of Ecology, 2001. Stream Sampling Protocols for the Environmental Monitoring and Trends Section. Publication Number: 01-03-036. Electronic version available at:

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Reed, G.K. and R.D. Wood. 1976. Ecology of Inland Waters and Estuaries, 2nd Edition, D. Van Nostrand, New York, NY. 485 pp.

American Health Association 1998. Standard Methods for the Examination of Water and Wastewater, 20th Edition, American Public Health Association, Washington D.C.

Standard Preservation and Handling Information for Water Samples

Parameter	Container	Preservation	Temperature	Holding Time
Barometric Pressure	NA	NA	NA	NA
Conductivity	NA	NA	NA	NA
Dissolved Oxygen	NA	NA	NA	4 days
Fecal coliform, Enterococci	500 mL glass/polypropylene autoclaved bottle		Cool to <4°C	24 hours
pH		NA	NA	NA
Turbidity	500 mL widemouth poly	NA	Cool to <4°C	48 hours
Suspended Solids	1000 mL widemouth poly	NA	Cool to <4°C	7 days
Total Phosphorus, Total Nitrogen, Nitrate + Nitrite, Ammonia	125 mL clear widemouth poly	Acidify with H ₂ SO ₄ to pH<2	Cool to <4°C	28 days
Dissolved Orthophosphate	125 mL amber widemouth poly	Filter in field	Cool to <4°C	48 hours
Hardness	125 mL narrowmouth poly	Acidify with H ₂ SO ₄ to pH<2	Cool to <4°C	6 months
Low Level Total Metals	500 mL Teflon FEP bottle	Acidify with HNO ₃ to <2pH	Cool to <4°C	6 months
Low Level Total Mercury	500 mL Teflon FEP bottle	Acidify with HNO ₃ to <2pH	Cool to <4°C	28 days
Low Level Dissolved Metals	500 mL Teflon FEP bottle	Filter, acidify with HNO ₃ to <2 pH	Cool to <4°C	6 months
Ammonia	NA	NA	NA	28 Days
Total Persulfate Nitrogen	NA	NA	NA	28 Days
Nitrate + Nitrite	NA	NA	NA	28 Days
Total Phosphorus	NA	NA	NA	28 Days
Ortho Phosphate	NA	NA	NA	48 Hours

Standard Preservation and Handling Information for Water Samples

Parameter	Detection Limit	Precision	Method
Barometric Pressure	NA	0.02 inches Hg	Field measurement
Conductivity	1 μ mhos/cm @ 25°C		Field measurement
Dissolved Oxygen	0.1 mg/L	0.1 mg/L	Standard Methods for the Examination of Water and Wastewater, 20th Edition, No:4500-O C, Winkler Method, Azide Modification.
Fecal coliform, Enterococci	1 colony per 100 mL	1 colony per 100 mL	Standard Methods for the Examination of Water and Wastewater, 20th Edition, No: 9222D. 24 hour Membrane Filter (MF) method. Enterococci Method - EPA 1600 24 hour MF method.
pH	NA	assumed 0.1 pH units	Field measurement
Turbidity	0.5 NTU	0.5 NTU	Standard Methods for the Examination of Water and Wastewater, 20th Edition, No: 2130 B. Nephelometric Method
Suspended Solids	1 mg/L	1 mg/L	Standard Methods for the Examination of Water and Wastewater, 20th Edition, No: 2540 D. Total Suspended Solids dried at 103-105°C.
Total Phosphorus, Total Nitrogen, Nitrate + Nitrite, Ammonia			
Dissolved Orthophosphate			
Hardness			
Low Level Total Metals	Various	6 months	EPA 202.2 Method (Hotplate Assisted Digestion) and a modified version of EPA 200.7 Method (ICP).
Low Level Total Mercury	Various	28 days	EPA 245.7 Method (Free Bromide Digestion) and EPA 245.1 Method (Cold Vapor Absorbance)
Low Level Dissolved Metals	Various	6 months	Modified version of EPA 200.8 Method (Using inductive coupled plasma (ICP) – mass spectrometry (MS))
Ammonia	0.01 mg/L	See current Water Year Report for summary of latest QA data.	Standard Methods for the Examination of Water and Wastewater, 20th Edition, No:SM4500-NH3 H Ammonia (phenate) Method by Colormetric Flow Injection Analysis.
Total Persulfate Nitrogen	0.01 mg/L	See current Water Year Report for summary of latest QA data.	Standard Methods for the Examination of Water and Wastewater, 20th Edition, No:4500-N B Method by Colormetric Flow Injection
Nitrate + Nitrite	0.01 mg/L	See current Water Year Report for summary of latest QA data.	
Total Phosphorus	0.01 mg/L	See current Water Year Report for summary of latest QA data.	
Ortho Phosphate	0.003 mg/L	See current Water Year Report for summary of latest QA data.	

APPENDIX C

GIS MAPPING PRODUCT

GIS MAPPING PRODUCT - WATER QUALITY MONITORING PLAN

The need for a spatially-based mechanism to store, analyze, and disseminate monitoring program information was cited by the Technical Committee. To this end, a GIS mapping product was created for water quality sampling programs in the watershed. The following GIS mapping product contains sampling locations for historic and existing water quality sampling programs for surface water, groundwater and marine water. The GIS mapping product was developed using spatial information for sampling locations that were supplied by monitoring agencies. In many cases, sampling locations were only recorded on paper maps, and digitizing was necessary to input the locations into the GIS mapping product. In other instances, coordinates or spatial data files were provided and were input to the GIS. The resolution of the sampling locations in this product is dependant upon the level of accuracy of the coordinates provided.

The GIS mapping product can be viewed using ArcView software. To open the project,

1. Create a new folder, c:\TEMP
2. Place the DELIVERABLE folder inside C:\TEMP

This information is included in a text file called installation.txt on the CD.

Within the ArcView project, data is organized into four views:

- Figure 01 – Groundwater Sampling Locations,
- Figure 02 – DOH GW Monitoring Locations,
- Figure 03 – Surface Water Sampling Locations, and
- Figure 04 – Marine Sampling Locations and Priorities.

Shape files contained in each view are consistent with shape files on the corresponding figures included in the water quality monitoring plan. Each view can be accessed from the menu that appears when the project is opened. All monitoring program information that was provided for the water quality monitoring plan, including site specific attributes such as parameters sampled, sampling dates, and site name are located in the attribute tables associated with each shape file. Data can be re-arranged, sorted, and queried based on needs or questions of the Planning Unit or the data user.

Water quality data are not currently included in the GIS mapping product, as actual groundwater quality data were not collected as part of this project. A water quality database for surface water, groundwater and/or marine water data could be developed and linked to the mapping tool to provide a more advanced level of coordination of sampling efforts. With the addition of water quality data, the mapping tool could be used to map water quality trends, to map areas that are outside of water quality standards, or to allow evaluation of the spatial distribution of parameters levels in the database.

Water quality data tables can be joined to the GIS mapping product through a query (“join”) function using a common “key” field. For example, the “key” field for WSDOH Groundwater monitoring data is “pws_src_id.” Specific steps to creating the joined database vary depending on the format of the existing data. Once the data are joined, data can then be sorted and queried

for any needed information, such as sampling date, samples above MCL, etc. Answers to these queries can be displayed on the GIS product, tying the spatial and parameter data together.

The creation of a centralized water quality database would require compilation of water quality data for each applicable sampling program, and likely some extensive data management to coordinate the data structures. It would be necessary to review and analyze data tables for consistent structures, and to ensure that fields in the data tables are in the appropriate consistent formats for inclusion in the database. A consistency analysis of the data would be required to ensure that all parameters are reported in the same manner (for example, conductivity can be reported as “conductivity” or as “specific conductance.” If it is not reported consistently, it can not be queried accurately from the database).